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FOREWORD

The *United States Armed Forces Medical Journal* is the medium for disseminating information of administrative and professional interest to all medical personnel of the Department of Defense. The Assistant Secretary of Defense (Health and Medical) and the Surgeons General of the several services invite all medical officers, dental officers, Medical Service Corps officers, Nurse Corps officers, and officers of the Veterinary Corps of the Armed Forces, and the medical consultants of the Army, Navy, and Air Force to submit manuscripts for publication in this *Journal.*

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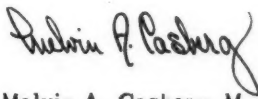
Monthly Message

The United States Armed Forces Medical Publication Agency, which was established on 17 November 1949, is composed of an officer from each of the medical services of the three military departments, one of whom is designated as Director of the Agency and Editor of its publications. In order to maintain continuity and impartiality of functions, the position of Editor of the Armed Forces Medical Journal is rotated every two years among the military representatives assigned to the Agency, in the order of Navy, Army, and Air Force.

Colonel Wayne G. Brandstadt, MC, USA, was assigned as Editor of the Armed Forces Medical Journal on 1 July 1951, the first Army officer named to this position. His ability as an editor and his knowledge of scientific writing greatly enhanced the value of this publication. Under his skillful guidance and editorship during his tour of duty as Editor, which terminated on 30 June 1953, this publication was outstanding in the field of medical publications. The articles published afforded much valuable medical information to everyone who read them. In maintaining the high editorial standards of the Armed Forces Medical Journal, Colonel Brandstadt's performance of duty was most commendable and reflects favorably upon himself, the medical services of the United States Army, and the Department of Defense.

Colonel Robert J. Benford, USAF (MC), was appointed Director of the Agency and Editor of its publications on 1 July 1953. I am confident that under his able guidance and editorship, the Journal will continue to be outstanding in the field of medical publications.



Melvin A. Casberg, M. D.
Assistant Secretary of Defense
(Health and Medical)

AGE AND RESISTANCE TO MILITARY STRESS[1]

NORMAN Q. BRILL, *M. D.*
GILBERT W. BEEBE, *Ph. D.*
REGINA L. LOEWENSTEIN, *A. M.*

THE world situation today necessitates continuing attention to the problem of military security. Because manpower is perhaps the most important factor in national defense, great interest is properly focused on it. Traditionally the active military defense of a nation has been relegated to its younger men because of their greater ability to fight and to endure physical hardship. Because of the experience in World War II, more than ever before it is recognized that emotional stamina is also important.

When universal military training was proposed as one means of meeting our defense needs, there was concern about its possible effect on the mental health of the young men of the country. From a strictly military standpoint, it became important to have precise information on how well young men stand up under the stress of military service. If it were known that men 18 or 19 years of age were much more prone to an emotional breakdown than were men of 20 or 21, this fact might affect the decision as to the age limits on compulsory military service. Reports of previous studies have seemingly contradictory conclusions. It was found in studying World War I material that men under 21 broke down in combat in greater numbers than their proportion in the Army would warrant *(2)*. This conclusion was based on the doubtful assumption that men who were sent into combat in World War I were of the same age distribution as those entering the Army except for the time required for them to be trained and moved overseas. Hogben and Johnstone *(3)* analyzed the British World War II experience and found that the likelihood of breakdown increased with age. Although the greatest percentage of

(1) From the Department of Psychiatry, George Washington University School of Medicine. Winfred Overholser, M. D., Professor of Psychiatry, was the responsible investigator.

This study was supported by a contract with the Veterans Administration and constitutes part of the co-operative program of follow-up studies developed by the Committee on Veterans' Medical Problems, National Research Council, and the Veterans Administration with the aid of the Army and Navy.

breakdowns occurred in the younger men, the relative incidence of breakdown was far lower in this group than in the older age group.

The incidence of psychoneurotic breakdown may be regarded as a result of stress and inherent resistance (or predisposition). This formulation is vague and in a statistical analysis of groups of cases it is not possible to specify stress or resistance for a given person. Moreover, we have not attempted to measure stress, but only to categorize it qualitatively for several military environments such as service in the zone of the interior, active regimental combat duty, overseas service to the rear of active combat regiments, and the various years of service (first, second, et cetera). It was possible to obtain adequate Army data on these items for 1944. To the extent that any such environment represents the same objective stress, however defined, for men of all ages found within it, age variation in the incidence of psychoneurosis may be imputed to age variation in inherent resistance to such stress. The foregoing assumption is not strictly true because the younger men usually receive the more stressful assignments within any military environment. Therefore, if the approach followed here were to show that younger men in a particular environment have a higher rate of breakdown, we should hesitate to infer that they possess less resistance, but because the data studied suggest that their rate of breakdown is usually lower, we believe that younger men have greater resistance to military stress and that our estimates of the differential are on the conservative side.

GROSS VARIATION IN AGE INCIDENCE OF PSYCHONEUROSIS

During the calendar year 1944 there were in the Army an estimated 321,500 admissions for all psychiatric causes *(4)*, distributed as follows: (1) psychoneuroses, 233,800; (2) psychopathic personality, 23,500; (3) psychoses, 22,900; (4) primary behavior disorders, 20,300; (5) observation for nervous and mental disease, 13,600; and (6) mental deficiency, 7,400. Of the 233,800 admissions for psychoneuroses, about 15,000 were officers; 3,500, enlisted women; and 18,500, nonwhite enlisted men. The investigation of age was confined to the white enlisted men, whose admissions were estimated at 197,000 for 1944 (84 percent of all psychoneurotic and 61 percent of all psychiatric admissions in that year). The average admission rate for psychoneurosis in white enlisted men in 1944 has been estimated at 31 admissions per 1,000 strength per year and is a constant on which virtually all rates presented in this article depend.

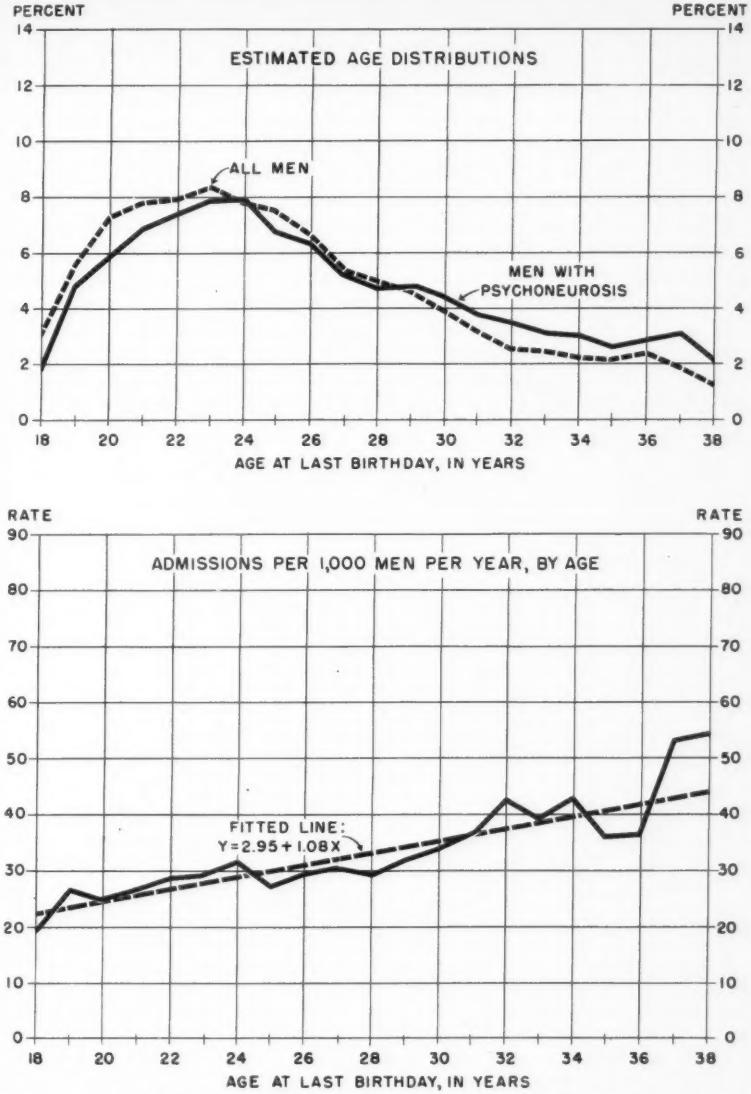


Figure 1. Incidence of psychoneurosis by age, white enlisted males, U. S. Army, 1944.

The Surgeon General, U. S. Army, made available to us for a follow-up study a sample of 7,100 punchcards representing admissions for psychoneurosis of white enlisted men in 1944. It is from these punchcards and a subsample of about 1,000 taken from

them for intensive follow-up study *(5)* that our estimates have been developed.

The upper panel of figure 1 gives the estimated age distribution *(6)* of all white Army enlisted men in 1944 and the parallel age distribution for men with admissions for psychoneurosis. In the lower panel appear the corresponding admission rates. Ages beyond 38 years were omitted because of their small representation. Being based on samples, both the age distributions themselves and the admission rates are subject to sampling fluctuation. For example, the 95 percent confidence interval on the calculated admission rate of 29 for men aged 22 in 1944 is from 23 to 34 admissions per 1,000 strength per year. For purposes of estimation we have fitted the straight line $Y = 2.95 + 1.08X$ by the method of least squares (where X is age at last birthday and Y the admission rate) to the estimated rates, allowing each the proportionate weight obtained from the age distribution for the population of white enlisted men.

TABLE 1. *Relation between length of service in 1944 and admissions per 1,000 men per year for psychoneurosis, U. S. Army white enlisted men*

Years of service	Percentage distributions		Rate*
	Total strength	Admissions for psychoneurosis	
	(a)	(b)	
First	19.0	22.5	36
Second	42.5	33.0	24
Third	24.2	25.9	33
Fourth	11.6	13.2	35
Fifth or beyond	2.7	5.4	61
Total	100.0	100.0	31 (c)
Number of cases	5,816**	6,973	—

* (b) divided by (a) and multiplied by (c).
** Man-years of service in 1944.

The increase in admission rate with advancing age is unmistakable, and it will be noted that the rate for men aged 18 is the lowest of the entire set. So many factors combine to produce this variation, however, that its full meaning is not obvious.

AGE AND LENGTH OF SERVICE

To explore the possible meaning of the gross variation exhibited in figure 1 we first subdivided our samples by length of

service in 1944 and estimated admission rates for psychoneurosis by both length of service and age. Table 1 is a summary of these data by length of service only, regardless of age. A disproportionately high rate characterizes the first year of service.

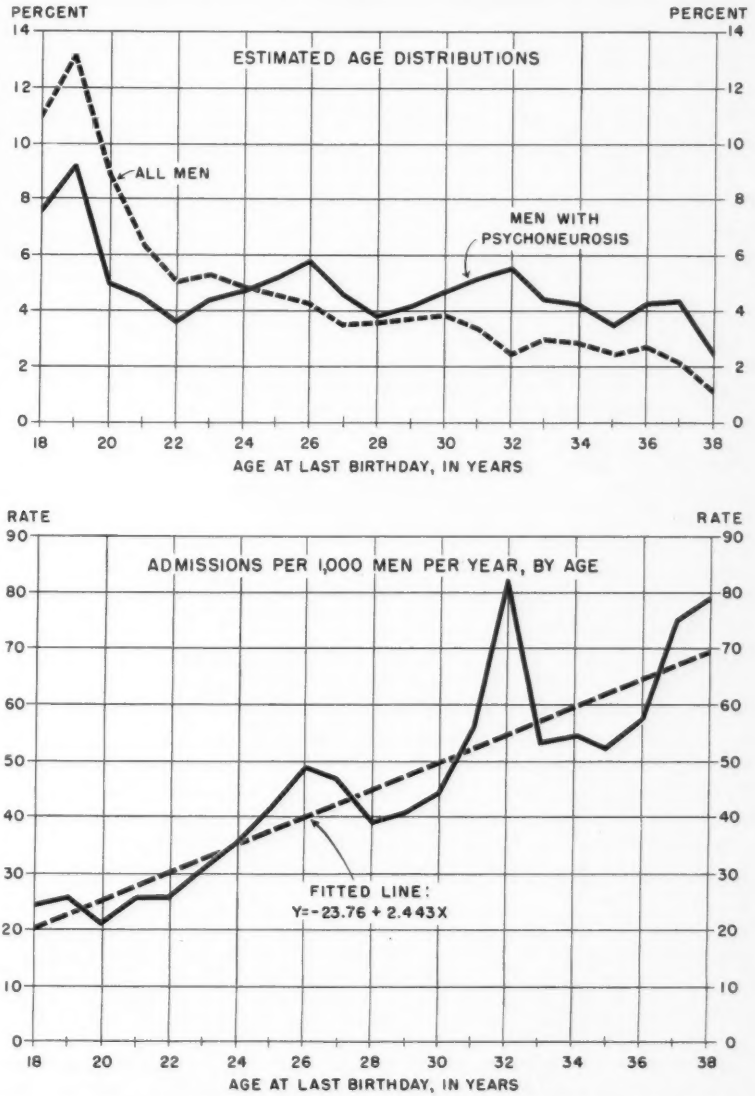


Figure 2. Incidence of psychoneurosis by age, white enlisted males in first year of service, U. S. Army, 1944.

This is followed by a low rate in the second year and a gradually increasing rate thereafter. On the basis of such material, no evaluation of the relative importance of stress and resistance in the first year of service can be made but the findings of a follow-up study of emotional breakdowns in World War II *(7)* confirmed the clinical impression that the men who broke down early usually were those with more obvious pre-existing emotional difficulties (less inherent resistance).

The first year of service, then, is in part a screening process. How the objective stress of the first year of Army life compares with that of subsequent years is a question to which this material gave no answer, but because the rate of breakdown for the second year of service was much lower than that for the first year, it would seem that the stress in the second year, however great, is insufficient to overcome the average resistance of men in the second year as compared with that in the first year of service. By the third year stress had increased to such an extent, whether by virtue of combat or by cumulative effect, that this advantage was offset and the breakdown rate approximated that of the first year. Very few men were exposed to combat stress in their first year of service and it seems probable that objective stress increased with lengthening service, if only by virtue of an increasing probability of dangerous assignment. Although it could be postulated that there is a cumulative effect of stress, other than combat, associated with lengthening service, it could also be argued that many men grow accustomed to the noncombat stresses of military service and become better able to cope with them.

TABLE 2. *Relation between age and admissions for psychoneurosis, per 1,000 men per year, by length of service in 1944*

Years of service	Admissions per 1,000 men per year by age						
	All ages	18	19	20	21	22	23
1	36	25	25	20	26	26	30
2	24		27	22	23	20	22
3	33			68	47	46	31
4	35				32	37	37
5 or more	61					28	61

The age-specific data for each of the 5 length-of-service groups in 1944 is too great for presentation, but that for the first year is of special interest and has been summarized in figure 2. Comparison with figure 1 shows that the variation as-

sociated with age is greater in the first year than in the subsequent years combined. Older men break down 2 or 3 times as often as the younger men. During the first year of service the admission rate increased by about 2.4 units for each year of age, in comparison with 1.1 for all years of service combined. If the sampling of men of each age were unbiased and the experience of the first year represented the same objective stress for men of all ages, then the lower panel in figure 2 would provide a measure of resistance by age. There is no reason to think that the older men would be exposed to greater objective stress than the younger men. If anything, there would be a tendency to spare them in training schedules and assignments. If the stress for each age were equated, either the same line as appears in the lower panel of figure 2 or one rising even more steeply would result. It seems fair to conclude that there is at least as much age variation in rate of breakdown (and, conversely, in resistance) in the first year of service as is shown in figure 2. Younger men are better able to adjust to the requirements of the first year of Army life than are older men, by the criterion employed here.

In the second year of service the effect of age in producing variation in the admission rate is minimal. The screening has dipped more heavily into the older ages and although resistance has not been equalized there has been some tendency in this direction. Starting in the third year, when the average level of stress is probably very different, the age differentials in rate of breakdown again become evident, but are strongly modified by the fact that by now the men at the younger ages have much more dangerous assignments (more being in combat) than the older men. In consequence, the rates for the younger men tend to be above average beginning in the third year of service, as may be seen from table 2, which summarizes the age-specific rates for the younger ages. This phenomenon turns out to be primarily an effect of using the younger men in combat; that is, the chance of a combat assignment after 2 or 3 years of service was especially high for the younger men. Therefore, except perhaps for the first year, no constant relationship between stress and length of service can be assumed.

AGE AND DIFFERENT MILITARY ENVIRONMENTS

To permit the selection of groups of men subjected to widely different stresses, all military service in 1944 was divided into 3 environments for white enlisted men in the Army: (1) zone of the interior; (2) overseas, in the rear of active regimental combat; and (3) active regimental combat. The second was the least homogeneous group and included troops in base areas as well as in the division rear areas and all Air Force personnel overseas, regardless of combat status. The experience of a quiet theater

would have been preferable, but we were unable to develop an estimate for such a theater. The age distributions and corresponding admission rates for men in the zone of the interior in

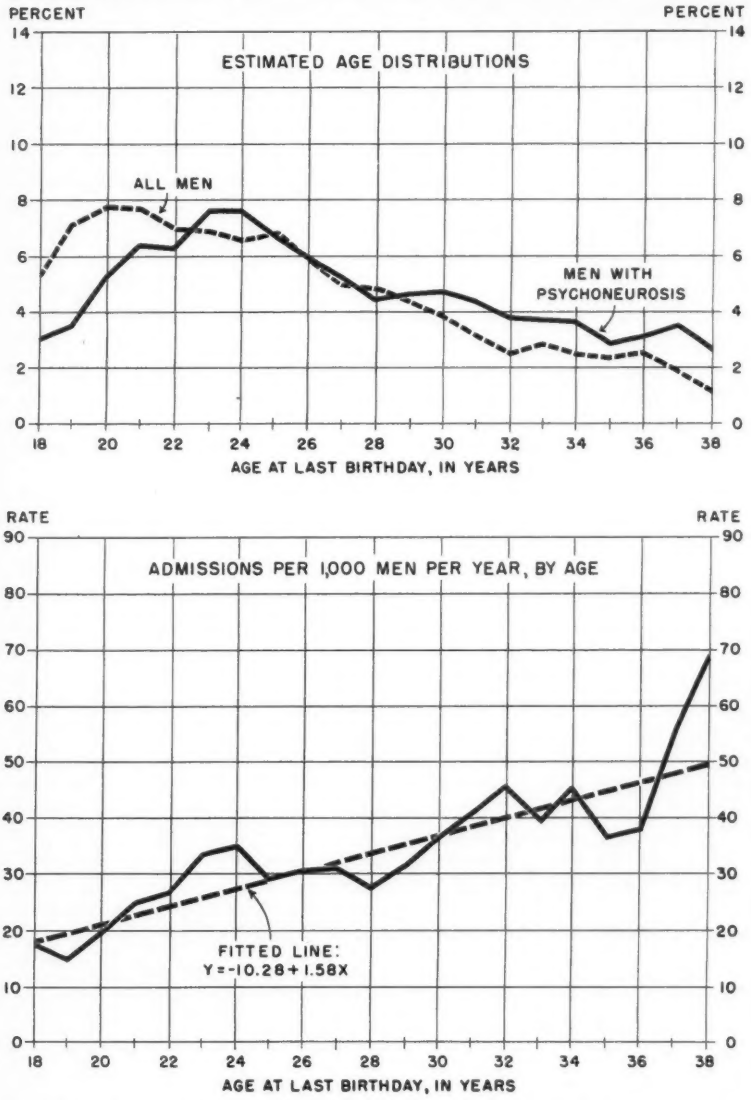
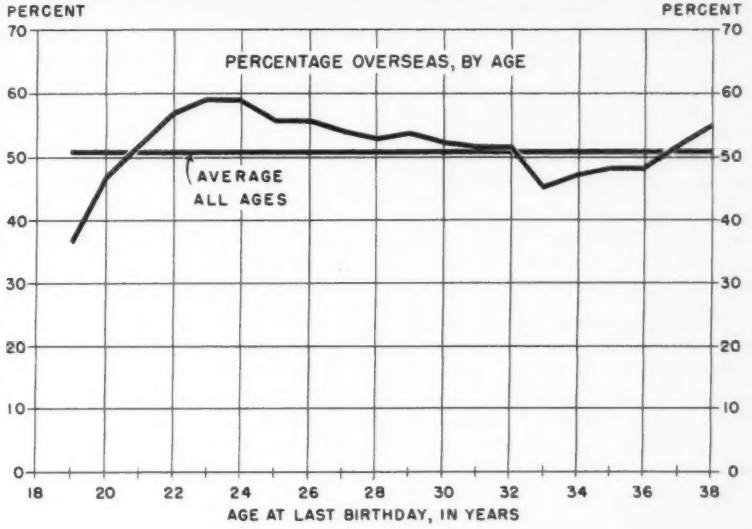


Figure 3. Incidence of psychoneurosis by age, white enlisted males in the zone of the interior, U. S. Army, 1944.

1944 appear in figure 3. The rate of increase is erratic but definitely upward and somewhat greater than that shown in figure 1 for the entire 1944 experience, regardless of military environment.



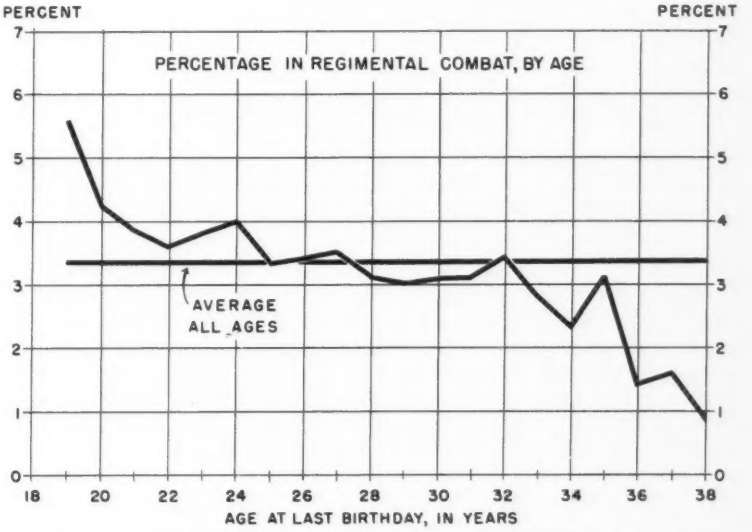


Figure 4. Percentage overseas and percentage in regimental combat, by age, U. S. Army white enlisted males, 1944.

The chance that a white enlisted man in the Army in 1944 might be overseas was, on the average, about 0.51; and in a regimental combat unit, about 0.03 *(8)*; and in both instances there was great variation with age, but the patterns of variation differed greatly, as may be seen in figure 4. This gives, for men of each age, the percent overseas (upper panel) and the percent in a regimental combat unit (lower panel). The percent in combat was greatest for men of 19. The estimated age distribution for men in the regimental combat unit is the age distribution for 1,926 men with bullet wounds in 1944 who appeared on 6 rosters of Army battle casualties being used in the Veterans Administration-National Research Council program of medical follow-up studies. No essential age difference existed between it and the one for men with shell-fragment wounds. In taking the age distribution of wounded men as the age distribution of men in combat regiments, we assumed that the chance of wounding was the same for men of all ages in the regimental combat units. This assumption could be wrong because even within the regimental area younger men tend to have the more dangerous jobs and are, therefore, wounded more often. If so, our estimated age distribution for men in regimental combat units exaggerates the proportions at the younger ages and underestimates those at the older ages. The age distribution of men who broke down in regimental combat represents 295 cases culled from the sample of 1,000 psychoneurotic admissions investigated intensively in the follow-up study. Men who broke down in rear areas or after leaving combat were excluded. Because of the small size of the sample, it is not very reliable at the older ages, i. e., above 30.

AGE AND RESISTANCE TO COMBAT STRESS

In figure 5 the estimated age distribution of men who were in regimental combat units in 1944 is compared with the distribution of those who broke down; the admission rates are shown in the lower panel. The average admission rate in regimental combat in 1944 was independently estimated at 285 admissions per 1,000 man-years and, as may be seen from the plotted points, no significant variation with age was found. There is no real evidence here of significant age variation in resistance to combat stress among men in regimental combat in 1944. It remains possible that such age variation was obviated by the many selective influences operating to determine which men participated in regimental combat. On this view, older men participating in regimental combat would tend to have a higher level of resistance than men of their age generally. Certainly the figures plotted in figure 4 show that there was ample opportunity for such selection, for the chance of combat assignment was much smaller for older men. Also, with an average rate of breakdown of 28.5 per-

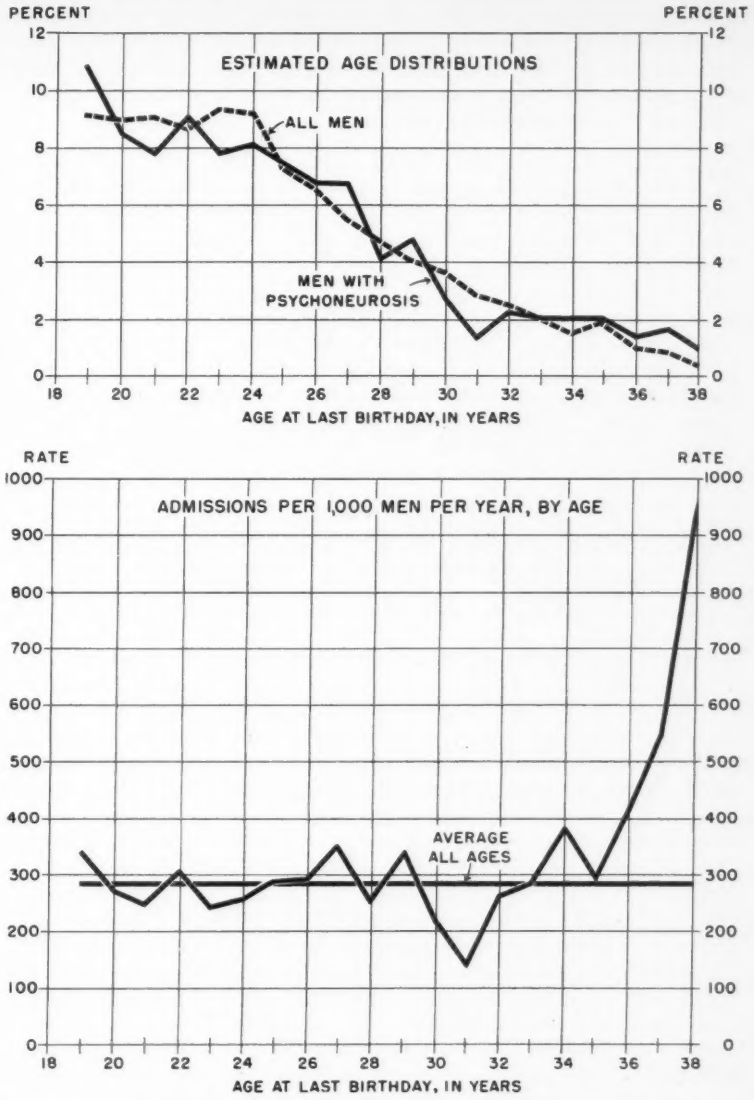


Figure 5. Incidence of psychoneurosis by age, white enlisted males in regimental combat, U. S. Army, 1944.

cent per year the stress of regimental combat may be of such magnitude as to exceed some point on the resistance scale at which younger men no longer have an advantage. In any event, if, on the basis of these data alone, we cannot assert that younger

men manifest greater resistance than older men, we can at least be reasonably sure that they have no less resistance. If the selection of men for combat could be taken into account, it might be possible to show that younger men actually have more resistance to combat stress.

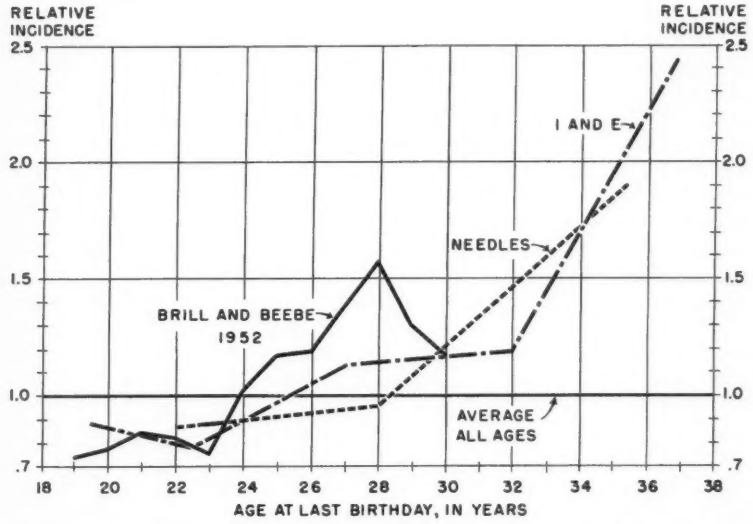


Figure 6. Previous estimates of incidence of neuropsychiatric illness, by age, for men in combat.

Because the above conclusion is somewhat contrary to our own preliminary estimate *(10)* and to the observations of others *(11, 12)*, it requires further study. We were led to re-examine our own data because in another study *(13)* of a longitudinal character, free of the problem of matching patients with an emotional breakdown with suitable controls we failed to find any suggestion that age played a role in the chance of breakdown among men in frontline, high-risk occupations. Our preliminary estimate, plotted in figure 6, represents 140 men in the follow-up sample who broke down only once during their military service and were coded as having broken down "in combat." The criteria for the latter designation included a specification that, for ground combat, it would apply to a breakdown in the regimental area, but the regimental area was not carefully defined and breakdowns in air combat were also included. In this restudy we recoded every patient according to rigid criteria for ground combat at the regimental level. In so doing we excluded fliers and some ground combat patients who were not in a strictly regimental combat area; the men excluded were somewhat older than those retained.

It was also desirable to add men who had broken down more than once during service. These men were younger than others when they broke down in combat in 1944.

Finally, we had, in addition to the patients allocated to psychiatrists for follow-up, about half as many who had been studied on the basis of military records only. These, plus additional patients found to meet the present criteria (bringing the total to 295 admissions), were reviewed. The final result of this restudy appears in figure 5. The effect of the various changes is to destroy entirely the variation with age. In figure 6 are shown 2 other series which suggest, as did our preliminary estimate, that resistance to combat stress is greater in younger men. The Needles series *(11)* consisted of 100 patients with early combat neuroses from the European Theater of Operations evacuated from forward points to a neuropsychiatric center and 100 controls who had been evacuated to a neighboring general hospital with a medical or surgical condition sustained in combat. The observed variation with age was not statistically significant. From the published details it was not possible to determine whether combat was rigorously defined in such fashion as to ensure comparability of the controls and the psychiatric patients.

INFORMATION AND EDUCATION

The Information and Education Section series *(12)* consisted of 400 men with psychiatric diagnoses studied in 4 clearing stations of the Fifth Army in December 1944 and April 1945 and 1,754 infantrymen in "letter" companies of the same divisions as controls in April 1945. When the 2 distributions were put together, the resulting age-specific ratios, shown in figure 6, rose quickly with the age, and there was no doubt of the statistical significance of the relationship. There was also no doubt that the controls, chosen from letter companies, provided an excellent basis for estimating the age distribution of men in the regimental area, for they represented about 60 percent of the strength of the infantry regiment, but whether the controls accurately portrayed the age distribution of the entire division, from which the psychiatric admissions were evidently chosen, might be questioned. An estimate of the age distribution of the entire division based on that of the men in letter companies would probably be too low but whether by an amount which would be sufficient to introduce a spurious relationship unfortunately remains unknown. Our own preliminary series has the defects already mentioned and we no longer regard it as reliable for a regimental combat unit, but the Information and Education Section series may adequately represent the situation at the divisional level.

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When the series from our restudy was compared in detail with that of the Information and Education Section an adequate agreement of the controls was found. The difference lay in the fact that the Information and Education Section series of psychoneurotic patients was definitely older. The agreement between the control series (men in letter companies and those wounded in action) provided indirect evidence that the wounded in action adequately reflect the age composition of regiments in ground combat.

The available evidence is in conflict, on the role of age in combat. If the Information and Education Section series is accepted, then the younger men have the greater resistance. Our own data suggest that age plays no significant role. The one conclusion which both series support is that resistance to breakdown in regimental combat is no less in the younger than in the older men actually participating in regimental combat.

TABLE 3. *Relation of environment to admissions for psychoneurosis*

Environment	Mean strength	Admissions for psychoneurosis	
		Number	Rate per 1,000 man-years
Regimental combat	214,600	61,150	285
Other overseas	3,044,600	40,950	13
Total overseas	3,259,200	102,100	31

RELATION OF ENVIRONMENT

From the standpoint of stress the environment in the rear of regimental combat was associated with a small amount of combat but represented predominantly noncombat experience. The estimated subdivision of the total overseas experience in 1944 is shown in table 3. By comparison, the rate for the quiet American Theater (largely Alaska but including bases in North, Central, and South America) was about 18 in 1944 *(4)*. The total neuropsychiatric admission rate for the European Theater of Operations in 1943 has been estimated from another source *(14)* at 21. The calculated value of 13 used here is plainly of the right order of magnitude. Figure 7 gives the resulting age distributions for the total strength and for men with admissions for psychoneurosis, and the corresponding admission rates. The lower panel also contains the admission rates for the entire overseas strength by age, in and out of regimental combat. Once the effect

of combat is removed, it is seen that the admission rate rises almost as sharply with age as was observed for men in the zone of the interior and in their first year of service.

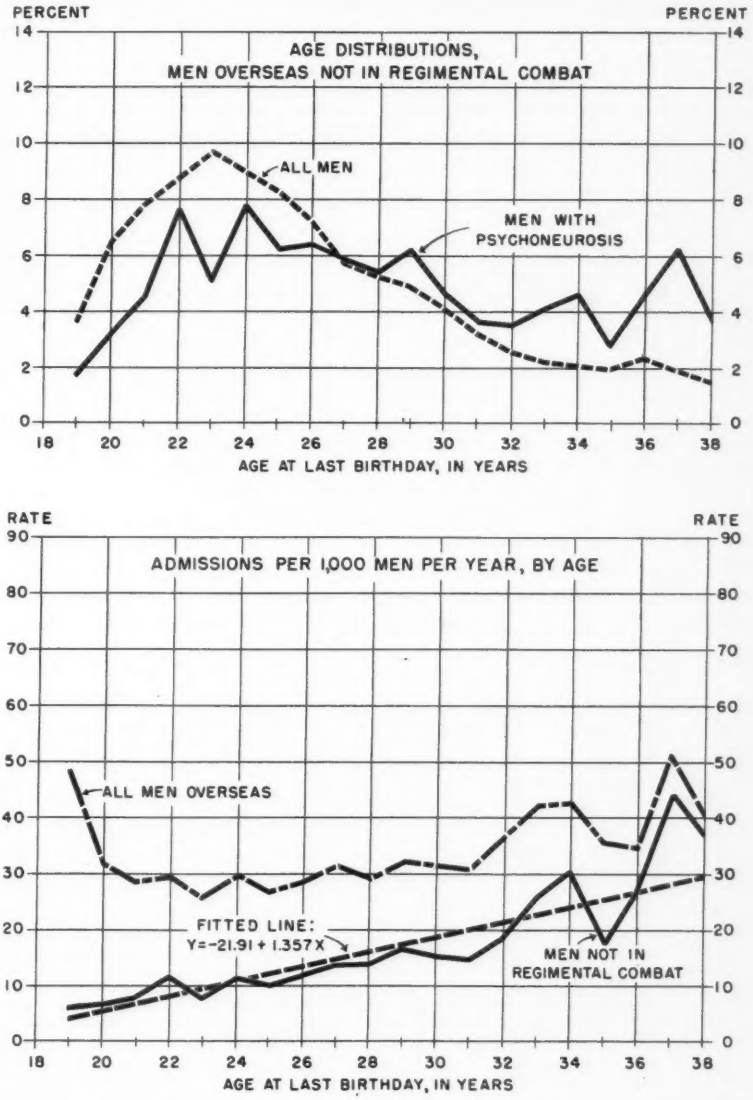

Figure 7. Incidence of psychoneurosis by age, white enlisted males overseas, U. S. Army, 1944.

AGE AND VARIATION IN RESISTANCE TO STRESS

Thus far it was assumed that stress and resistance were inversely related and comparisons have been qualitative. It would be advantageous to have a quantitative device for scaling the resistance of groups of men. If we consider breakdown in a person to be precipitated by a stress of such intensity that it exceeds his intrinsic resistance, then the proportion of men who break down (the admission rate) will rise as stress is increased, or fall if a group with higher resistance is substituted. Any environment will contain a manifold of stressful factors of different intensities, not one of fixed intensity, just as the exposed persons will have more or less resistance to all manner of stressful phenomena. It is, therefore, an oversimplification to describe the admission rate as the ratio of stress to resistance, especially when the latter factors are undefined, but if we do so the expression

$$\text{Admission rate} = \frac{\text{Stress}}{\text{Resistance}}$$

provides an arbitrary device for scaling resistance whenever stress is fixed. If there is a single environment in which 2 groups are equally exposed and manifest different rates, their relative resistance may be characterized as proportional to the reciprocals of the admission rates. By so doing, however, we are no closer to a definition of resistance. All we have gained is a measure which permits various groups, exposed to constant stress, to be scaled according to their relative ability to withstand stress.

When the above rough formulation is used as a descriptive device, its value is impaired to the extent that stress cannot be taken as a constant for all age groups in the particular environment, but, because any departure from this assumption will come about in these data only if older men experience less objective stress, and because none of our estimates suggests that older men have greater resistance, the assumption will at worst lead to an underestimation of the relative advantage enjoyed by younger men.

In figure 8 we show the estimates of relative resistance by age within each of the military environments studied here. In every environment except in regimental combat, relative resistance falls off rapidly with age. The decline is least overseas in the rear of regimental combat areas and greatest in the first year of service. These 2 environments represent the extremes of selection.

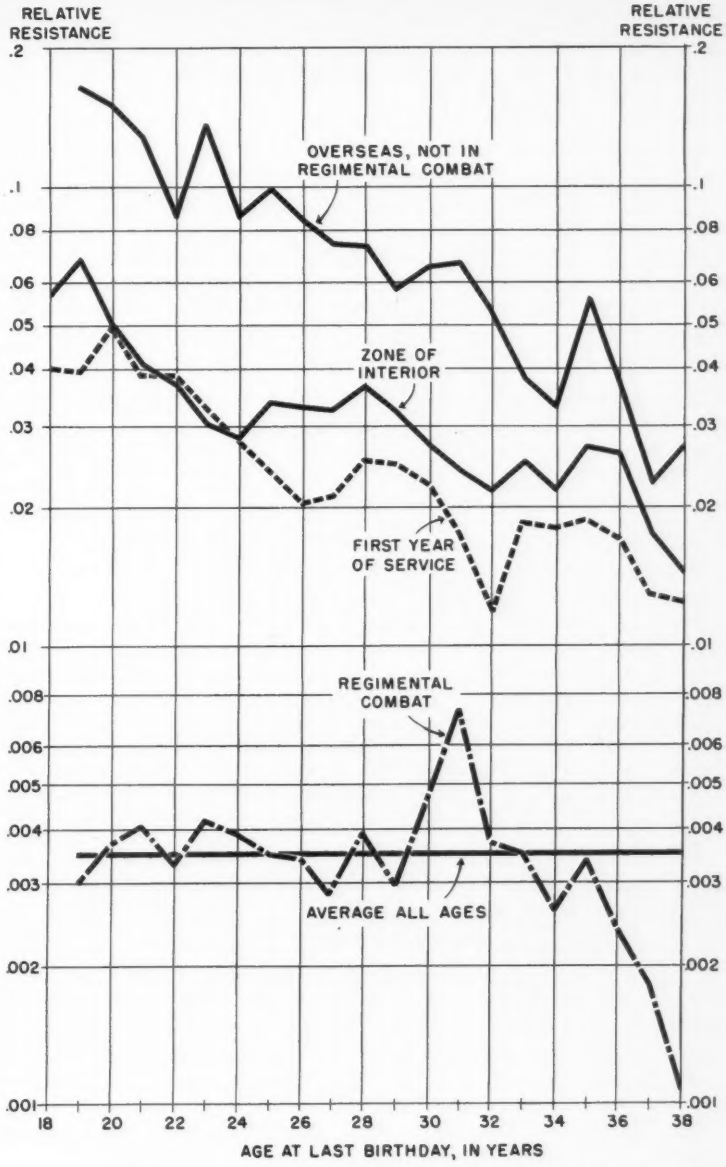

Figure 8. Relative resistance to breakdown with psychoneurosis, by age and by military environment, white enlisted males, U. S. Army, 1944.

We cannot expect age to compete with a psychiatric assessment in describing the resistance of a group of men, but operating policy decisions in regard to age of men in military service must be made. The data exhibited here show that resistance to military stress is greater in younger men in the several military environments, with the possible exception of regimental combat where it is no less. If the men of each age group could be scaled individually as to their resistance and plotted in the form of frequency distributions, a series of overlapping distributions in which the relative proportion of men in the region of low resistance would rise steadily with increasing age could be expected. Using the rate of breakdown as a guide to relative resistance very slight differences exist among the age groups in the region of high resistance, but there is no doubt about the behavior of the distributions in the region of low stress.

The greatest differences found among the age groups occur in the first year of service. More of the older men are susceptible to the unfamiliar stresses of the military environment. For any individual age the measure of resistance has a large sampling error, but averages of several years are moderately stable:

Age (years)	*Relative resistance*
18-19	.040
20-24	.038
25-29	.023
30-38	.017

Men of any age entering the second year of service may be regarded as a screened group rid of at least part of those who are most susceptible to military stress. One effect of the screening is to lower the rate of breakdown in the second year for men of every age and to decrease the age differentials in admission rates. As presented in figure 3, the zone of the interior material included most of the experience of the first year. Although we were unable to derive a firm estimate of the zone of the interior experience for men in their second or subsequent year of service, it is plain that there is relatively little variation by age in zone of the interior troops who have passed through the first year. When all of the breakdowns occurring in the first year of service were taken out of the zone of the interior estimation the rates still increased with age, but to a lesser extent than shown in figure 3. It would appear that the screening of the first year was sufficient to remove much of the age differential in resistance to zone of the interior types of stress.

In the selection of men for overseas service there was surely a tendency to retain in the zone of the interior men with lower resistance, so that on the average the overseas population must

have had more resistance. Stress was greater overseas and age differentials in resistance were brought out among men in the rear of regiments in combat. Forward of that point, however, men were even more highly selected and stress was so much greater that it apparently cut across the resistance scale at a point where there were no longer any age differentials of consequence, producing rates of breakdown which do not vary significantly by age.

If all men of the same age, exposed in different environments, had the same resistance, the relative stress of the various environments could be graded. Such is not the case because of the selection of personnel for various assignments and for continued service, but the general nature of such selection is known, and although it prevents us from estimating stress we may at least put lower bounds on the relative measures of it. Such selection is probably least at the youngest ages, say from 19 to 24. At the simplest level, the average rate is 13 for troops not in regimental combat areas and 285 for those in regimental combat areas, a ratio of about 1:22. The stress of regimental combat may be called 22 times that of overseas service in the rear of combat regiments if stress is measured by its capacity to produce psychiatric casualties, but because men of a given age serving in combat are presumed to have a higher level of resistance than men of that age serving to the rear, the calculated ratio is a lower limit. If cognizance is taken of the fact that the men in and out of combat are probably most comparable at the youngest ages, from the fitted lines in the region of the ages from 19 to 24 it may be estimated that the stress of regimental combat may be on the order of 40 or more times that characteristic of rear areas overseas.

INTERPRETATION

The military population is a screened population, and we know from World War II induction statistics that the rejection rate for mental disease increased notably with age. For the period April 1942 to March 1943 the Selective Service monograph *(15)* on age gives the following estimated rejection rates:

Age at examination (years)	*Rejections for mental disease (per 1,000)*
18-25	35
26-29	55
30-37	76
38 or more	92

These rates increase about as fast with advancing age as do the neuropsychiatric admission rates for men in their first year of

service. Men of 18 and 19 had the lowest rejection rates *(15)*, and this fact underlies the recommendation by the Selective Service System that "men 18 and 19 years old should be liable for induction as they comprise the age group most physically fit." The present study suggests that this age group is also the most emotionally fit to resist the various stresses of military service.

At the upper end of the age range the information provided here is of less decisive value. Our estimates of resistance suggest that the choice of an upper age limit is necessarily arbitrary. In this region, resistance is declining but, up through age 38 at least, there is no suggestion that any particular age is critical and age 38 must be regarded as an arbitrary dividing line.

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PARTIAL RECONSTRUCTION OF THE EAR AND AUDITORY CANAL (1)

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WILFRED T. TUMBUSCH, *Major, MC, USA (2)*
JAMES E. HEMPHILL, *Captain, MC, USA (2)*

AURICULAR defects sustained in the Armed Forces are numerous and frequently associated with other serious lesions. Repairs are indicated for they not only improve the appearance but also improve the morale of the patient. The timing of the surgery and length of the procedure are important considerations. Frequently the reconstruction of the ear is accomplished prior to or during the interval period occurring in the sequential treatment of other parts of the body. The objective is a repair that appears well at conversational distance.

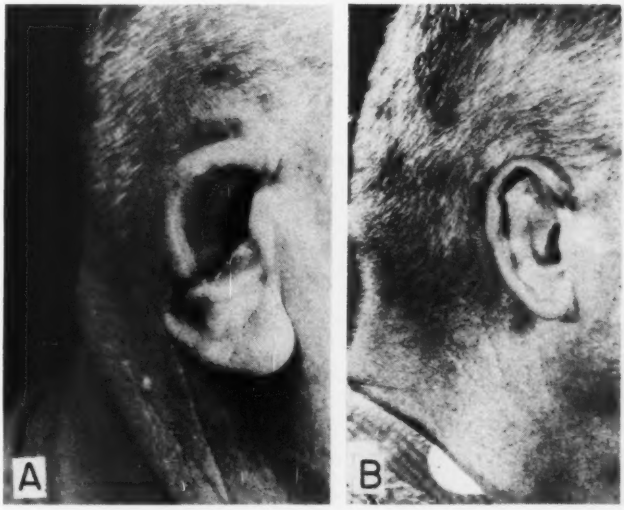

Figure 1. (A) *The residual defect after removal of an epithelioma.* (B) *The final appearance after plastic repair.*

(1) Presented before the Postgraduate Symposium on General and Military Medicine, Brooke Army Hospital, 10 December 1952.

(2) Brooke Army Plastic Surgery Center, Brooke Army Medical Center, Fort Sam Houston, Tex.

The surgically constructed ear should swing freely from the side of the head (fig. 1). It is composed of an epithelial covering on both sides supported by a cartilaginous graft. The first stage in reconstruction buries the remaining ear stump into the adjacent normal tissue. The stump border, freshened by excision, is approximated to the edge of the scalp behind or above the ear. This scalp skin, formerly behind the ear, now grown to the

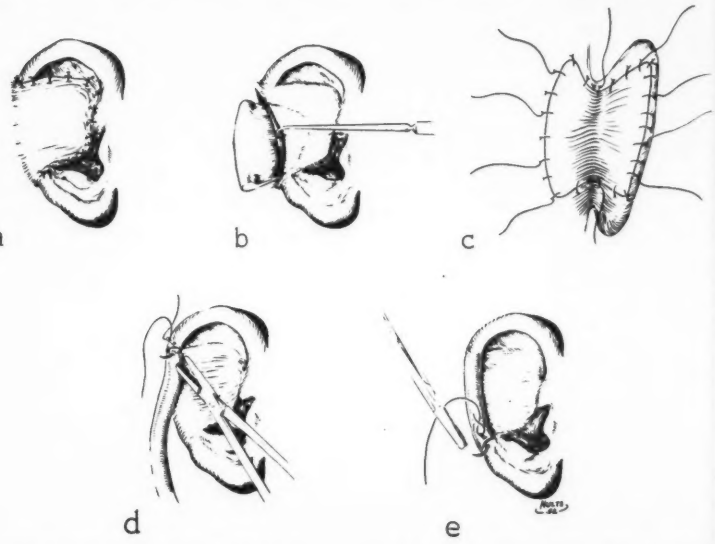

Figure 2. (A) *Implantation of ear fragments into the postauricular skin.* (B) *Insertion of cartilage beneath the adherent postauricular skin.* (C) *The reconstructed ear has been separated from the head and a skin graft applied for coverage of the raw areas. Long peripheral sutures are tied over a stent dressing.* (D) *and* (E) *Small tube-pedicle transplant completes the repair of the helix.*

stump border, forms the outer ear surface. Three weeks later, satisfactory union permits the second procedure. At this time, a piece of cartilage, either autogenous or homologous, is carved to the desired shape and inserted beneath the scalp flap. A month is allowed for healing and the establishment of an adequate blood supply. The third procedure provides the inner epithelial covering separating the ear from the side of the head. The scalp flap and subjacent adherent cartilage are carefully dissected, leaving a thin layer of soft tissue attached to the undersurface of the cartilage. The double raw surface presented is covered with a free skin graft taken from a nonhairy body area. Sutures are peripherally placed and tied over a form-fitting pack (stent dressing) to insure apposition of the graft to the recipient site (fig. 2 a, b, and c)

If the adjacent local skin is scarred, it is replaced with a three-quarter-thickness skin graft. Reconstruction may then follow. In figures 3A and 3B, repositioning of ear fragments and excision of cicatrix left a large denuded midsection. This was skin-grafted, completing the first stage of repair. Figures 3C and 3D show what can be attained when adjacent donor material has

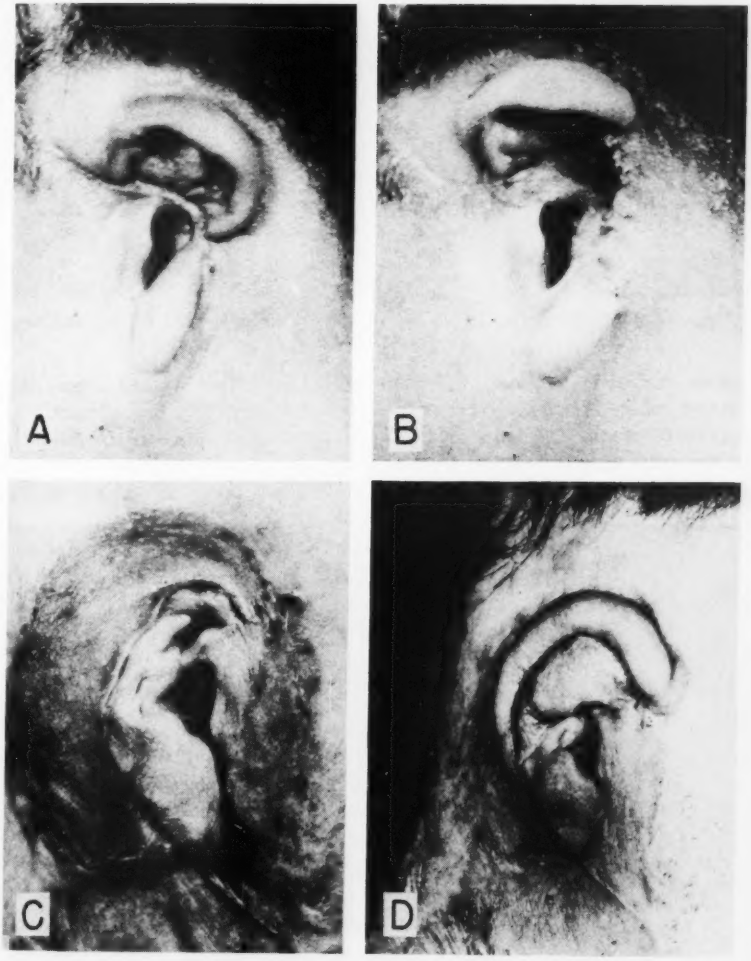

Figure 3. (A) *Ear in which local skin has been replaced by cicatrix with malposition of ear stump fragments.* (B) *The scar has been removed and remaining ear parts repositioned. A skin graft extends about the auditory canal joining the upper ear cartilage and postauricular normal skin.* (C) *A skin graft completely encircles a lobe fragment.* (D) *The upper two-thirds has been completely reconstructed.*

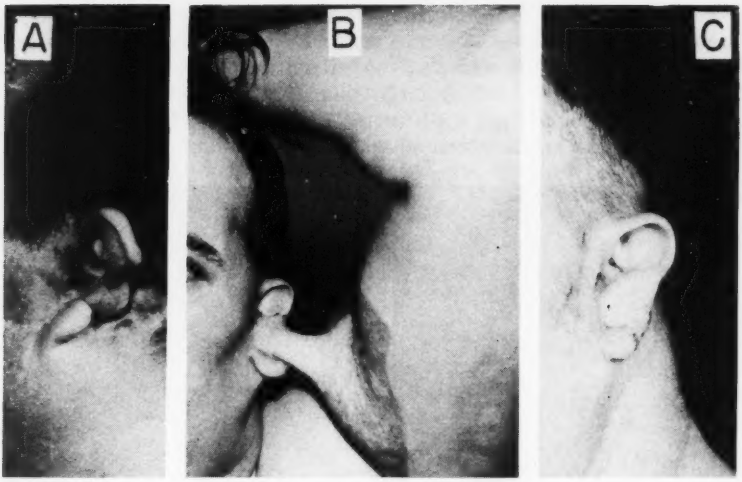

Figure 4. (A) *Defect.* (B) *Tube skin graft. (A plaster cast fixed the position.)* (C) *Final result.*

been largely supplied by skin graft. In this patient, the first stage of reconstruction began with the insertion of a cartilage graft beneath the skin graft. This procedure was followed by a skin graft applied to the medial surface of the embedded cartilage to free it from the side of the head. The final stage added the

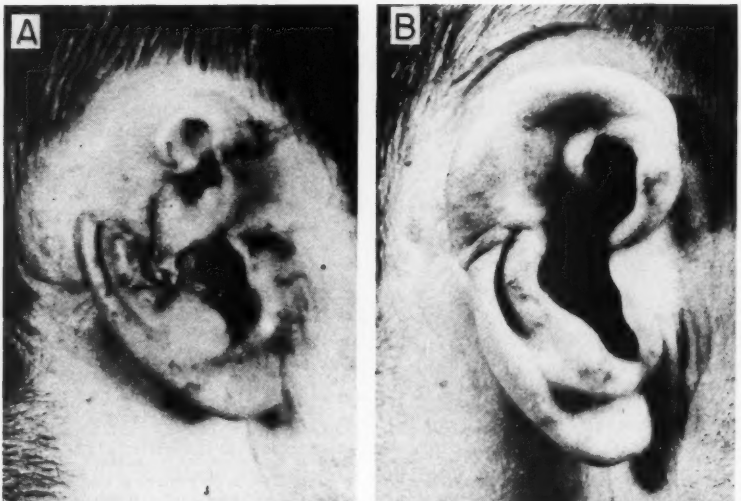

Figure 5. (A) *Defect before use of hand-carved cartilage insert.* (B) *Final result.*

tube rim. When donor sites in ear reconstruction must first be reconstructed by skin graft, longer time intervals must take place between subsequent surgical steps in order to permit the establishment of an adequate blood supply in each stage. Figure 4 shows an unusual method used to supply soft tissue volume. A tube skin graft in one stage was raised on the arm and immediately inserted into the recipient site. The pedicle was sectioned and insertion completed 3 weeks after attachment.

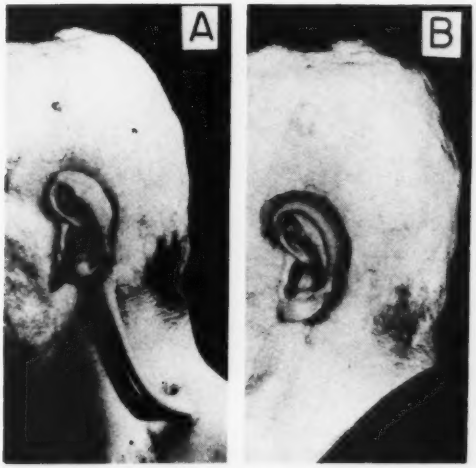

Figure 6. (A) *The first migration of the tube material used to reconstruct the helix.* (B) *Final result after third migration.*

Variations in technical procedure to obtain improvement in the appearance of the ear have largely involved the handling of the cartilage support material. Prefabrication before implantation beneath the scalp flap has been accomplished by using cartilage chips packed in vitallium *(3)* or acrylic *(4)* molds. These have been implanted in the abdominal wall until fibrous tissue united the small cartilaginous blocks. Hand carving of the cartilage has been accomplished when larger pieces of cartilage were available. The sculpturing method produces suitable ears (fig. 5). Prefabrication of cartilage combined with iliac bone refrigerated until time of use has been recently introduced *(5)*. The method shows possibilities which may make its use valuable.

Soft tissue transfers used to improve auriculocephalic angles consist of triangular flaps shifted from the mastoid region to the posterior surface of the ear *(6)*, and implantations of the remaining ear tube into the postauricular sulcus after completion of other ear parts.

Figure 7. The number of migratory stages required depends on the length of the tube.

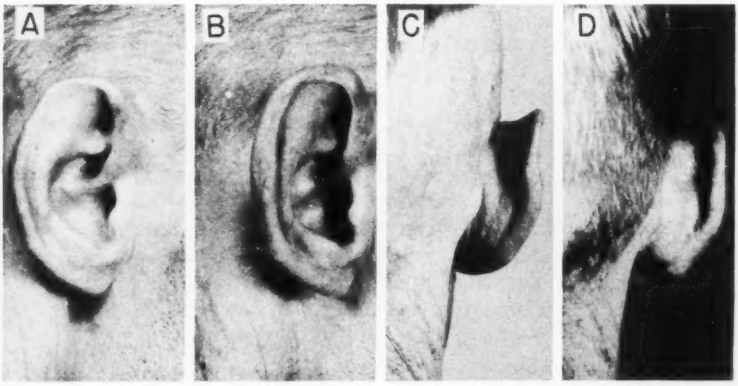

Figure 8. (A) *and* (C) *show the missing helix.* (B) *and* (D) *show the result achieved by advancing the postauricular skin.*

Ear rims, if desired, are produced by adding tissue to the periphery of the attached skin flap. This is accomplished by using the tube skin grafts formed locally and transferred to the proper position (figs. 2, D and E; 6 and 7). We now construct these in a transverse direction at the base of the neck (fig. 7). The older method of forming them across the flexion creases of the neck leaves noticeable scars. In men, the local donor site is covered adequately by clothing; in women the tube may be constructed

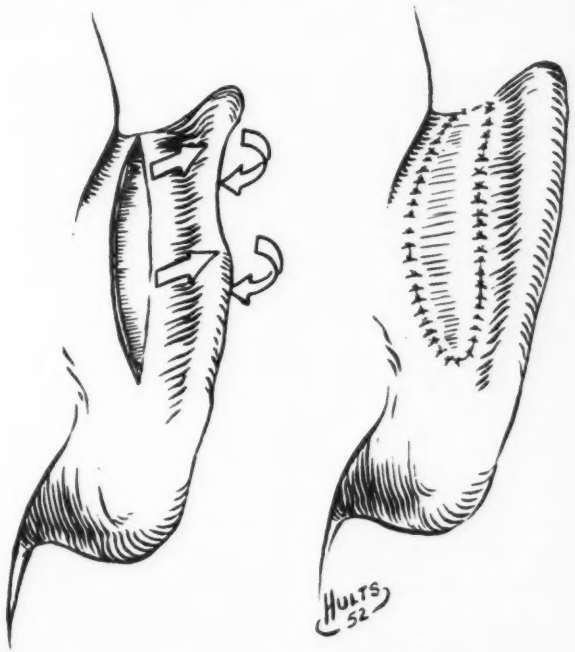

Figure 9. Diagram showing the procedure used to obtain the result shown in figure 8. The incision was made in the postauricular skin. The distal part was carefully undermined until looseness allowed the lateral advancement indicated by the arrows. A skin graft was placed in the denuded donor site.

in the vertical position just anterior to the hairline of the neck. We have used 2 other methods of construction for the helix that are more rapid than the tube pedicle and can be readily employed in certain defects. The first of these is the advancement flap used when losses are confined to the helix, as in some burns (fig. 8). The postauricular skin is advanced laterally, forming a helix roll on the outer aspect. A skin graft covers the denuded site (fig. 9). The rolled soft tissue construction will shrink in time

if supportive material is not incorporated. Contour-carved strips of cartilage as well as small portions of cartilage from a corresponding curvature of the auricular concha have been used. Attempts to incorporate tantalum failed because shrinkage pressure of the skin against the metal continued until its exposure required its removal. Another method of helix construction, more rapid than the migrating tube pedicle, uses the local scalp flap, which is left long about the periphery of the flap. This is rolled laterally and sutured as a tube. The method has been worth while and saves time (figs. 10 and 11).

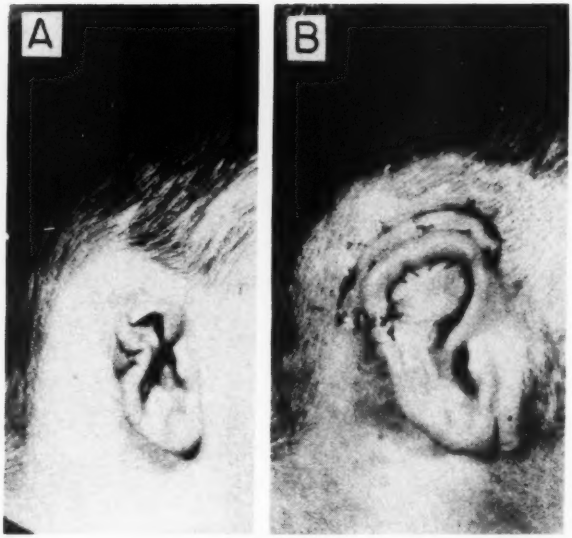

Figure 10. (A) *Defect before using local peripheral soft tissue to simulate the helix rim.* (B) *Result before removal of stitches.*

Preserved cadaver cartilage is used in many instances (*7, 8*). Calcified material is avoided for the foreign material is a hazard. Autogenous cartilage is preferred for a large or total reconstruction. In our experience, the traumatized soft tissue of the reconstructed ear in which preserved cartilage has been used, does not heal as well as when nonpreserved cartilage is used. With this transplant exposed and infection present, time will be saved in most cases by removing the cartilage at once. Healing then will be rapid, permitting an early definitive repair. Antibiotic therapy has been used for infections with specific organisms. Xiphisternal bovine cartilage has not been used (*9*).

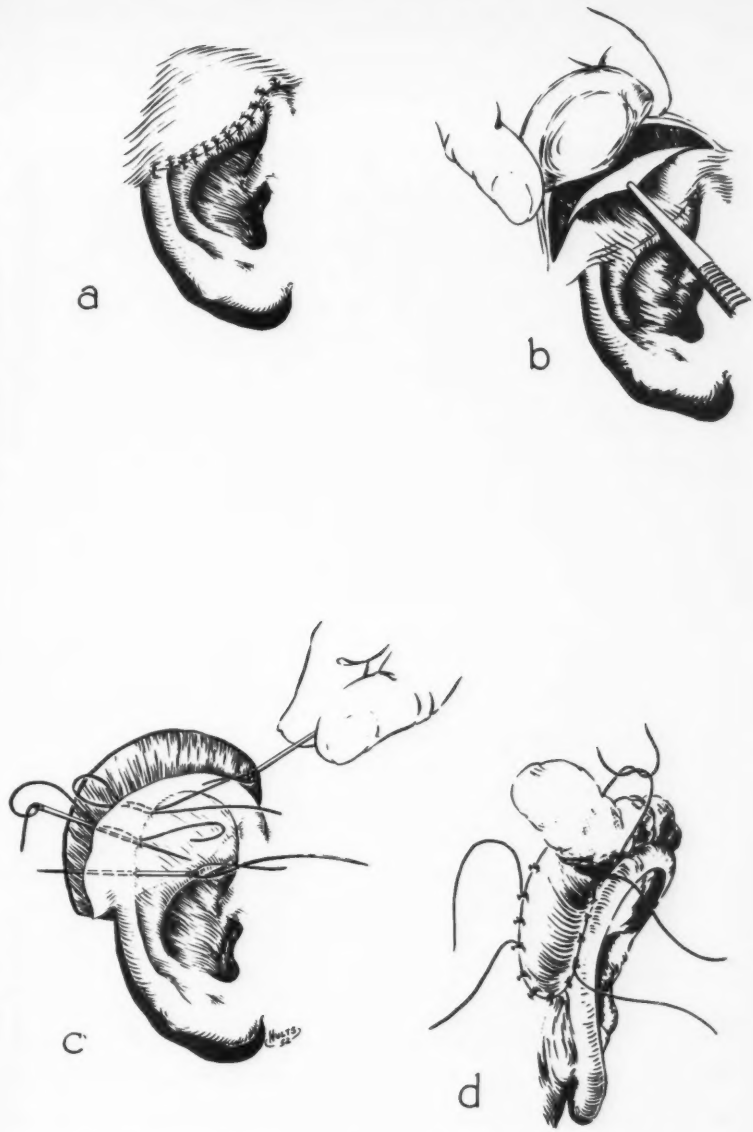

Figure 11. Diagram showing procedure used to obtain the result shown in figure 10. (A) *First stage.* (B) *Implanting the cartilage.* (C) *and* (D) *Construction of the rolled rim and coverage of denuded area by stent-fixed skin graft.*

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Associated destruction of the external auditory canal occasionally is present (fig. 12). This is repaired by excising the obliterating cicatrix and reconstructing the epithelial lining. A model of the canal size is made at the time of operation and a

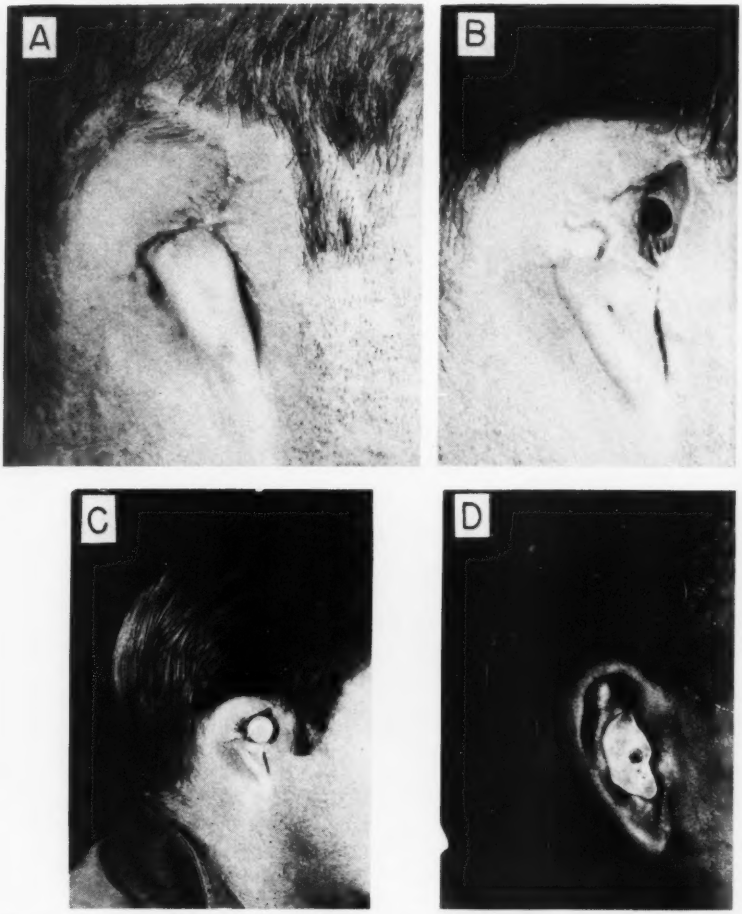

Figure 12. (A) *Defect before reconstruction of the external auditory canal by inlay skin graft.* (B) *The canal and immediately adjacent area composed of one continuous piece of skin.* (C) *and* (D) *Acrylic distenders in place in 2 patients.*

hollow acrylic dilator is constructed from this model (fig. 13). The dilator is inserted into the newly lined canal immediately on the removal of the surgical stent. A time lapse of even a few

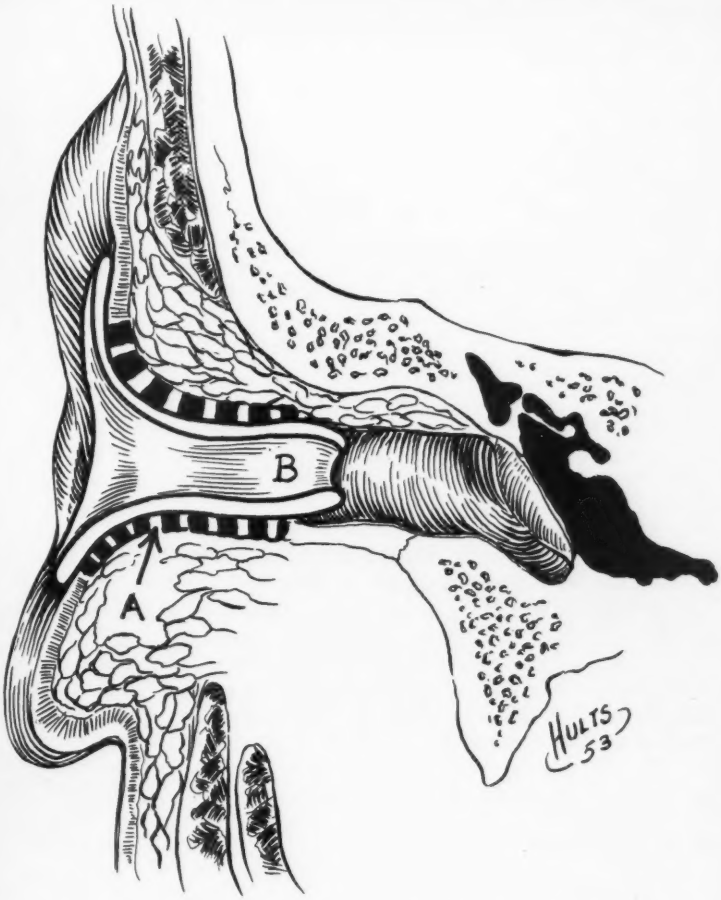

Figure 13. Cross section showing adherent skin graft forming new lining (A). The form-fitting acrylic distender (B) is hollow.

hours between removal of the stent and insertion of the dilator may permit contraction that cannot be overcome without an additional operation. The acrylic distender is kept in place until the contractile phase has passed. This period may last from 3 to 6 months. The principle of Z-plasty has rarely been applicable *(10)*.

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OFFICERS OF A. M. A. SECTION ON MILITARY MEDICINE

Major General Harry G. Armstrong, Surgeon General, U. S. Air Force, was elected chairman of the Section on Military Medicine at the annual meeting of the A. M. A. in New York in June 1953. Other officers elected were Dr. I. S. Ravdin, member of the Civilian Health and Medical Advisory Council, Office of the Secretary of Defense, and John Rhea Barton Professor of Surgery, University of Pennsylvania School of Medicine, vice chairman; and Colonel Charles L. Leedham, MC, USA, Chief of Education and Training Division, Office of the Army Surgeon General, secretary.

Military surgeons were forerunners of medical science. Disease and obscure injuries were supposed to come from displeasure of gods and demons, and were treated by magic. Injuries of battle, however, were inflicted by human agents. They were understandable, and necessitated some crude knowledge of anatomy and physiology; for they had to be treated by methods more rational than incantation.

—*William Holland Wilmer*

A STUDY OF PREMATURE INFANTS

ARTHUR G. SMITH, *Captain, USAF (MC)*

OGDEN C. BRUTON, *Colonel, MC, USA*

ONE of the major challenges confronting the medical profession today is the reduction of fatalities attributable to premature births. Deaths due to prematurity account for 30 percent of all deaths during the first year of life and for 46 percent of those in the first month.[1] The reduction of these fatality rates must be preceded by accurate analyses and reporting of uniform data, including the many factors which lead to the birth of premature infants and contribute to their death. Although the American Academy of Pediatrics[2] in 1935 defined a premature infant as "a live-born infant who weighs 2,500 grams or less at birth (not at admission), regardless of the period of gestation," and recommended the reporting of premature infants in specific 500-gram weight groups, many authors have subsequently coined their own definitions. As a result, studies which are otherwise accurate are difficult to interpret and compare with studies which abide by the recommended criteria. One study[3] grouped stillbirths and live births together; another[4] categorized the premature infants in terms of pounds rather than grams; and still another[5] used 2,250 grams as the maximum weight for prematurity. The present study was undertaken because it was thought that comparative studies of fatality and survival rates among our premature infants would assist us in evaluating our methods of care.

CLINICAL MATERIAL

This study represents a review of the clinical records of those premature infants who were either born in or admitted to this hospital soon after birth during the 53-month period of March 1948 through July 1952. Of the total of 505, the records of 20 premature infants contained insufficient data for inclusion in the study, leaving 485 infants as the basis of this report. The definition of prematurity used was that recommended by the American Academy of Pediatrics;[2] hence, stillbirths were excluded and single and multiple births were grouped together. In addition, births occurring inside and outside a hospital were grouped to-

From Walter Reed Army Hospital, Washington, D. C.

gether, there being only 14 (3 percent) of the latter. The fatalities reported excluded any which occurred subsequent to discharge from the hospital. Although the socioeconomic background of these infants varied widely, no attempt at classification of this factor was made.

INCIDENCE OF PREMATURITY

Of a total of 5,651 live births during the 53-month span, 505 (8.9 percent) were premature. This incidence is well within the 7 to 11 percent range given by Dunham,[1] but is higher than the average (6.1 percent) reported by 323 hospitals throughout the country.[6]

TABLE 1. *Distribution of 485 premature infants according to weight*

Birth weight (grams)	Births		Deaths	
	Number	Percent*	Number	Percent**
0-1,000	27	5.5	25	92.2
1,001-1,500	27	5.5	15	55.5
1,501-2,000	102	21.1	16	15.7
2,001-2,500	329	67.9	12	3.6
Total	485	100.0	68	14.0

*Percent of total births.
**Percent of births in weight group.

Birth weights. The 485 records which could be adequately studied were grouped according to the infant's weight (table 1). More than two-thirds of the births fell into the 2,001- to 2,500-gram group.

Sex. Although most observers reported a slight preponderance of female premature births, 52.2 percent in our series were boys.

Length of gestation. As shown by fatality studies, the length of gestation directly influences the maturity of an infant. Because this factor is often indefinite or unreliable, it cannot be used as the only criterion for prematurity. The definition of prematurity according to birth weight has its faults, but it is the most accurate measurement available. Table 2 reveals that about 43.1 percent of these infants had gestational lengths of more than 37 weeks. In a series reported by Taback,[7] 51 percent of the premature infants had gestational periods of more than 37 weeks.

TABLE 2. *Distribution of 485 premature infants according to length of gestation and the effect of gestation on the fatality rate*

Length of gestation (weeks)	Births		Deaths	
	Number	Percent	Number	Percent
28 or less	33	6.8	30	44.1
29 - 31	22	4.5	12	17.6
32 - 34	78	16.1	14	20.6
35 - 37	140	28.9	9	13.2
38 - 40	195	40.2	3	4.5
More than 40	12	2.5	0	0
Undetermined	5	1.0	0	0
Total less than 37	273 (±5)	56.9 (±1)	65	95.5
Total more than 37	207 (±5)	43.1 (±1)	3	4.5

Race. More than three-fourths of the infants in our series were Caucasian (table 3). Because the racial distribution among the 5,651 live births was unknown, we were unable to determine the racial incidence of prematurity. Other studies have reported a higher incidence in the Negro than in the white race.[7, 8]

TABLE 3. *Distribution of births and deaths of premature infants according to race*

Race	Births		Deaths	
	Number	Percent	Number	Percent
Caucasian	370	76.3	53	77.9
Negro	113	23.3	15	22.1
Mongolian	2	0.4	0	0
Total	485	100.0	68	100.0

Age at discharge. In a review of the American literature, the average length of hospital stay of premature infants who survived ranged from 24 to 28 days.[9] Figure 1 shows that 80.8 percent were discharged within 3 weeks after birth. Perhaps the high percent discharged within the first week is a consequence of the large group who weighed from 2,001 to 2,500 grams at birth. It has been the policy in our nursery not to discharge premature infants until they have achieved a weight of 2,270 grams.

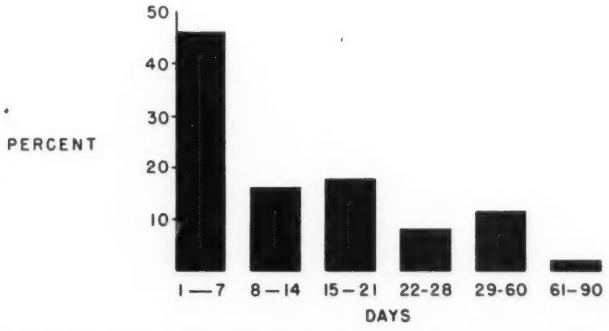

Figure 1. Length of stay in hospital for 485 premature infants.

FATALITY STUDIES

Data[4] collected from 12 large United States hospitals disclosed premature infant fatality rates ranging from 15.9 to 32 percent. A later report[6] gave an average fatality rate of 21.5 percent in 323 hospitals. In our series there were 68 (14 percent) deaths (table 1). Of the 14 who were born outside the hospital, 5 (35.7 percent) died. Although this is too small a number of births outside the hospital to warrant definite conclusions, this figure closely approximates the fatality rates of such births reported by others.[6] Forty (59 percent) of those in our series who died were infants whose birth weight was 1,500 grams or less. The rates in each weight group in our series closely parallel those reported by other authors.

Sex. Table 4 shows that in our series 69.1 percent of the deaths occurred in male infants. It will be recalled that 52.2 percent of all the premature infants were boys. This is in accord with other reports[4,8] of higher fatality rates in premature male infants, but no satisfactory explanation has been advanced.

Length of gestation. Despite the fact that about 56.9 percent of the births had gestational periods of 37 weeks or less, 65 (95

percent) of the deaths occurred in this group (table 2). Although not shown in this table, it has been found by Steiner and Pomerance[5] that for a given weight group, the fatality rate varies inversely with the length of gestation. It would seem, therefore, that length of gestation is a very important factor influencing the chance of survival of premature infants.

Race. It has been stated that the fatality rate is higher for Negro than for white premature infants.[1] As may be seen in table 3, however, in our series the racial fatality rates corresponded very closely to the racial birth rates. The much lower fatality rate for Negroes in our study (13.3 percent) than in the study by Crump et al.[8] (22.2 percent) cannot be adequately explained.

TABLE 4. *Effect of sex on the fatality rates of premature infants*

Birth weight (grams)	Number of births	Deaths			
		Male		Female	
		Number	Percent	Number	Percent
0 - 1,000	27	12	48.0	13	52.0
1,001 - 1,500	27	13	86.6	2	13.4
1,501 - 2,000	102	14	87.5	2	12.5
2,001 - 2,500	329	8	66.6	4	33.3
Total	485	47	69.1	21	30.9

Delivery. Tyson[4] stated that a breech delivery is the most hazardous of ordeals for the premature infant. In his study, the fatality rate following a breech delivery was 60 percent. In our series, breech extraction accounted for only 11.6 percent of the deliveries, but 32.4 percent of the deaths (table 5). Despite numerous allusions in the literature to a high fatality rate following cesarean sections, there was only 1 death among the 19 premature infants delivered in that manner in this hospital.

Time of death. The first week of life is an extremely critical period for the premature infant. This has been especially true in this hospital where 97 percent of the deaths of premature infants occurred within the first week of life (table 6). Elsewhere the situation has differed very little. Simpson and Geppert[10] reported 57 percent of deaths within the first 24 hours, and from 80 to 90

TABLE 5. *Type of delivery of the premature infants and the fatalities resulting from each type*

Type of delivery	Births		Deaths	
	Number	Percent	Number	Percent
Normal spontaneous	290	59.8	31	45.6
Low forceps	112	23.1	12	17.6
Other forceps	5	1.0	0	0
Cesarean section	19	3.9	1	1.5
Breech extraction	56	11.6	22	32.4
Version	3	0.6	2	2.9
Total	485	100.0	68	100.0

percent within the first week. Tyson[4] reported 81 percent of deaths within the first 2 days (compared to our 79.4 percent), and stated that babies who were born dead or who died within the first 2 days of life, usually died from complications of pregnancy, labor, or delivery. Reduction of premature fatality rates is, therefore, the responsibility of both the obstetrician and the pediatrician. Adherence to certain principles of the management of premature labor and its complications, as described by Taylor et al.,[3] may accomplish much toward this end.

TABLE 6. *Time of death of premature infants*

Time of death	Deaths	
	Number	Percent
Within first hour	3	4.4
Within first 12 hours	29	42.6
Within first 2 days	54	79.4
Within first 4 days	63	92.6
Within first 8 days	66	97.0
Within first 30 days	68	100

Cause of death. An autopsy was performed on 65 of the 68 premature infants who died in our series. The various causes of death, as obtained from the autopsy reports, are shown in figure 2. These data are presented not because we feel that they represent the true causes of death, but rather because we wish to emphasize the need for careful postmortem examinations and proper certification of causes of death, as strongly advocated by Bundesen et al.[11] They stated that a death which is diagnosed as being due to prematurity per se (used interchangeably with anoxia in our autopsy reports), may actually be due to abnormal pulmonary conditions. Atelectasis was reported as the cause of death in 29.2 percent of our cases, although Potter[12] stated that atelectasis was only a symptom of some underlying abnormality and should not be considered as a cause of death.

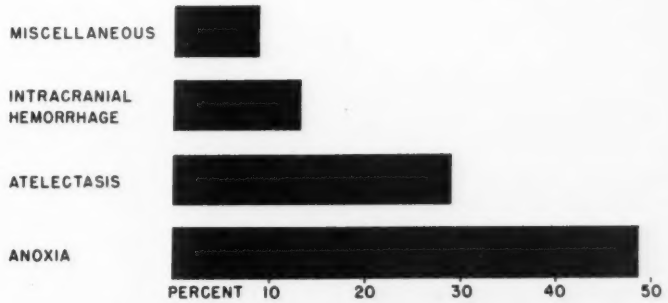

Figure 2. Causes of death of 65 premature infants.

Of the 65 infants on whom autopsies were performed, pulmonary hyaline membranes were found in 10 (15 percent) on microscopic examination. Seven of these 10 hyaline membranes were found among the 19 infants whose deaths were attributed to atelectasis. The significance of the pulmonary hyaline membrane has been the subject of much speculation, and some have even called it an "eosinophilic herring." Whether it actually is a cause of death or just an incidental finding awaits further study.[13] The remaining three patients with pulmonary hyaline membrane in our series also had intracranial hemorrhages. No hyaline membranes were found among those whose deaths were attributed to anoxia.

COMMENTS

In most premature births, the cause of prematurity is unknown. Some known complication which might contribute to the early termination of pregnancy occurs in about 40 percent of the cases.[14,15] Pomerance and Steiner[15] stated that of these complications, toxemia was the most common (20 percent), followed by placenta previa and abruptio (16 percent), serious maternal

illness (4 percent), abnormalities of the genital system (3 percent), syphilis (1 percent), and polyhydramnios (1 percent). In our study, 40.9 percent of the mothers had complications which included toxemia (15.2 percent), abruption of placenta (6.8 percent), placenta previa (2.1 percent), syphilis (0.8 percent), and other miscellaneous complications which totaled 14.4 percent. Premature rupture of the membranes which occurred in 95 (16.6 percent) of our cases was not included as a complication, because it has been shown that although this phenomenon occurs slightly more often prior to premature than prior to full-term deliveries, the difference is insignificant.[14]

Twenty-eight pairs of twins (11.5 percent) were included in our series. There were 9 deaths among these twins, representing a higher fatality rate than the average for both single and multiple births. It has been suggested that single and multiple births be grouped separately because the latter comprise a larger percent of infants in the 2,001- to 2,500-gram group, who are nevertheless mature. In addition to the higher fatility rate among our twins, a comparison by weight groups disclosed that only 50 percent of the twins in the 2,001- to 2,500-gram group (67.9 percent of the entire series fell in this weight group). From our studies, therefore, it would seem to be incongruous to group multiple births separately on the basis of increased maturity.

Different writers have attempted to correlate incidence of prematurity with seasons, and have variously reported higher rates in fall, winter, or summer. We were unable to detect any significant seasonal variation. Only two of our premature infants developed total blindness due to retrolental fibroplasia. The birth weights of these two were 1,053 and 1,198 grams, giving an incidence of 3.7 percent among all the premature infants who weighed 1,500 grams or less at birth.

SUMMARY

For the sake of uniformity all studies concerning premature infants should adhere to the criteria of prematurity recommended by the American Academy of Pediatrics. In a series of 5,651 live births, 8.9 percent were premature. Although sex seemed to affect the incidence of prematurity very little, more than 69 percent of the deaths were in male infants. Among the 485 premature infants who could be adequately studied, there were 68 deaths (14 percent). There seemed to be a definite correlation between length of gestation and degree of maturity, because more than 95 percent of the deaths occurred in infants who were born after less than 37 weeks' gestation. Race had no apparent effect on the premature fatality rate. A larger percent of deaths followed breech extraction than any other form of delivery. Ninety-seven percent of the deaths occurred within the first 8 days, most of these within the first 2 days.

There is a need for more careful postmortem examinations to determine the exact cause of death of premature infants. Single and multiple births should be grouped together in studies of this kind because there was no evidence of increased maturity among the multiple births.

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United States War Losses in Korea

MORE than 24,000 battle deaths have been reported among the armed forces of the United States in Korea since hostilities began on June 25, 1950. This number includes those killed in action or who died of wounds and the known dead among the men originally reported as missing. In addition, about 9,000 are still on the list of the missing. On the assumption that about nine tenths of these men are dead, the battle death toll in Korea rises to about 32,000. This total is somewhat more than one tenth the corresponding figure for World War II (December 7, 1941, to August 1945) and compares with well over 50,000 battle deaths suffered by the Army land forces alone in the Pacific area during that conflict.

Because of the greater number of men under arms in World War II, the disparity in the battle *death rates* is not as large. Our battle death rate in Korea, based upon the estimated toll of 32,000, averaged 3.5 per 1,000 a year from June 25, 1950 to June 12, 1953. This compares with an average battle death rate of 8.9 per 1,000 a year among the armed forces of the United States in World War II.

The heaviest losses of our armed forces in Korea were suffered in the early part of the conflict, as the accompanying table shows. For the second half of 1950 the battle death rate, based upon notifications to next of kin, was 7.9 per 1,000 a year, exclusive of those reported as missing in 1950 and later found or presumed to be dead. The rate dropped to 3.2 in 1951 and further to 1.3 in 1952; it was 1.1 up to June 12 of the current year. These rates are based upon the total armed forces, including those in this country as well as those abroad. When the battle deaths are related solely to the armed forces overseas, the rates for 1951 and 1952 are raised to 10.9 and 3.9 per 1,000, respectively. In World War II the overseas battle death rate for the United States Army varied from a low of 12.1 per 1,000 in 1943 to a high of 33.5 in 1944, with an average of 22.5 a year for the period 1942 to 1945.

In the Korean conflict, as in World War II, the Marine Corps suffered relatively heavier losses than any other branch of the service. Allowing for the probable dead among the missing, the battle death rate for the Marine Corps from June 25, 1950, to June 12, 1953, averaged 7.1 per 1,000 a year, compared with an average of 6.3 for the Army, 0.5 for the Air Force, and 0.2 for the Navy. Similarly, from December 7, 1941, to December 1945

the average annual battle death rate for the Marine Corps was 14.3 per 1,000, as against 9.4 for the Army, which then included the Air Force, and 4.2 for the Navy. Of the battle deaths among the land forces during World War II, more than 15 percent occurred among the Air Forces; in the Korean War the corresponding proportion was somewhat less than 5 percent.

Battle death rates by branch of service*
United States Armed Forces, June 25, 1950 to June 12, 1953

Year	Annual death rates* per 1,000 mean strength				
	Total forces	Army	Navy	Marine Corps	Air Force
1950	7.9	14.5	0.3	25.5	0.5
1951	3.2	6.0	.2	4.9	.3
1952	1.3	2.2	.2	3.9	.1
1953	1.1	1.8	.1	4.0	.1
1950 - 1953					
Reported*	2.6	4.8	.2	6.2	.2
Estimated Total†	3.5	6.3	.2	7.1	.5

*Includes killed in action, died of wounds, and known dead among missing in action. Based on notification to next of kin as reported by the Defense Department in weekly press releases.

†Includes, in addition to the known dead, 90 percent of the number still listed as missing.

Data on nonbattle deaths during the Korean War are not yet available for all branches of the service. Reports for the Navy and Marine Corps show that the average nonbattle death rate in the three years 1950 to 1952 was virtually the same as the average for the peacetime years 1946 to 1949. In fact, the death rate from disease was actually lower for the war period than in prewar years, but this improvement was counterbalanced by an increase in nonbattle injuries. From 1950 to 1952 the Navy and Marine Corps had an average annual death rate of 1.6 per 1,000 from nonbattle injuries and 0.3 from disease. In the four years 1942 to 1945 the comparable rates were 2.0 and 0.5 per 1,000, respectively. Nonbattle deaths in these services averaged about 1,600 annually from 1950 to 1952 and approximately 6,500 a year during World War II.

It is a reasonable assumption that in the Army and Air Force, too, the nonbattle death rate in 1950 to 1952 closely approximated that for 1946 to 1949, when it was 2.2 per 1,000—1.5 from

injury and 0.7 from disease. On this basis, the number of non-battle deaths in the Army and Air Force during 1950 to 1952 would be about 4,300 annually; in 1942 to 1945 the corresponding toll was 17,000 a year.

The very low death rate from disease among our armed forces in Korea indicates how very effective our military medical services have been, despite the handicap of singularly difficult conditions. Poor, often primitive, environmental sanitation; the high prevalence of infectious diseases; and extremes of temperature created many serious health problems which have been satisfactorily met. Losses resulting from exposure to cold have been reduced by instructing officers and enlisted men in preventive measures, by better clothing and equipment, and by improved techniques in the management of cases. Protective and sanitary measures have reduced the toll from the epidemic diseases, not only among military personnel but also among the civilian population of Korea. Altogether, the advances made through experience and research in safeguarding the health and life of our armed forces during the Korean War contribute a new chapter to the history of military medicine.

—Reprinted from *Statistical Bulletin*, June 1953

While psychology is a science, psychotherapy is an art that has been practiced, consciously or unconsciously, as long as human beings have been harassed by pains and aches. Not so long ago, menopausal syndromes were cured with ovarian tablets whose content of estrogenic substance was practically nil. This is only one arbitrary example of "unconscious" psychotherapy applied by men of science. It is hardly necessary to mention the therapeutic results of magicians, quacks and cultists of different brands. Modern medical psychotherapy is an art based on the scientific background of psychology. Today its necessity is unquestioned, though its indications are not yet so generally recognized by the medical profession as they should be.

—JULIUS BAUER, M. D.,
in *Annals of Internal Medicine*

THE TRANSITION OF THE CIVILIAN PHYSICIAN INTO THE AIR FORCE

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THE transition of the physician into an effective member of the Armed Forces medical team is an important procedure which requires tact, diplomacy, and training on the part of those responsible for its success. Many physicians who are called into the Air Force as a result of Public Law 779 are likely to have a sense of frustration toward the service. In the words of Churchill (2), "the moment a doctor gives way to frustration and reacts emotionally he can see nothing good in the 'service' and becomes resentful toward it." If these physicians can be stimulated to think about military service on an intellectual rather than an emotional basis, we have done a great deal to develop an immediately effective member of our medical team. Much of our indoctrination is therefore directed along these lines.

This paper describes the methods used in the Officers Indoctrination Course which is attended by all newly commissioned Medical Service Officers of the Air Force, but our remarks shall be confined in general to the Medical Corps.

The assignment orders of newly commissioned officers provide for temporary duty at the Gunter Branch, U. S. Air Force School of Aviation Medicine for a period of 35 days, after which the officer proceeds to his assigned duty station. A cordial letter containing helpful information is immediately sent to each officer informing him (1) what to bring in the way of money, personal effects, and equipment; (2) what housing is available; (3) how to reach the base, including travel procedures; (4) where to write concerning any change in orders; and (5) whom to contact upon arrival in Montgomery, Ala.

Induction into the service creates many serious problems in the physician's personal life, and an effective program of personal aid has been established. The legal assistance officer works closely with new officers, helping them in obtaining power of

(1) Gunter Branch, U. S. Air Force School of Aviation Medicine, Gunter Air Force Base, Ala.

(2) Churchill, E. D.: Standards of military practice in Army. Medical Bulletin, Hq Third Army, Ft. McPherson, Ga., Apr. 1952.

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attorney, aids them on income tax problems, and gives personal and legal advice. A mature and experienced officer of the Medical Service Corps is assigned as class supervisor for the indoctrination class.

The student officers spend a week of in-processing followed by the formal 4-week (156 curriculum hours) course *(3)*. This in-processing includes procurement of uniforms, accomplishment of physical examinations, initiation of personnel records and other essential procedures. The instructional program is based on teaching methods especially designed for an indoctrination program. Visual aids, especially films, are used for dynamic presentations. Panel discussions, conference type classes, practical demonstrations, and participation in field exercises are employed extensively in teaching. On the first day of the course, a one-act play or "skit" is presented to inform the newly commissioned officer of the purposes of the indoctrination course. Students react very enthusiastically to this presentation.

The instructional material in the 4-week course may be broken down into: (1) duties and responsibilities of all Air Force Officers; (2) military medicine; (3) special procedures of the Air Force Medical Service; and (4) duties and responsibilities of the 6 technical components of the Air Force Medical Service.

To perform the duties of a pilot, physician, engineer, or lawyer, an officer must have certain basic information. The organization and function of Department of Defense agencies, and the position of the Air Force in the broad framework, is explained. Lectures are given on current concepts of air power. The functions of the Department of the Air Force down to the lowest echelon are thoroughly examined. Indoctrination on aircraft and equipment currently in use is covered and the relation of flying safety programs to the Medical Service is outlined. Rescue and survival procedures are explained to show their influence on combat strength and morale. Personnel classification procedures are covered both for officers and airmen with particular emphasis on those which affect the newly commissioned officer of the Medical Service.

The student officer is instructed in how to wear his uniform correctly, and in the customs, traditions, and privileges of the service. This area includes military courtesy, leadership responsibilities, and management methods under military situations. During the 4 weeks of the course, 5 hours are devoted to drill and to basic instruction in participation at formations and ceremonies. Nearly every class takes part in a military review and retreat parade.

(3) Curriculum, Indoctrination Course for Officers of the Medical Service, Gunter Branch, U. S. Air Force School of Aviation Medicine, Gunter Air Force Base, Ala., 1 May 1953.

Students are taught how to utilize the Personal Affairs Office in arranging their individual problems to free them from worry and concern and thus increase their effectiveness as officers. To aid the new officer in establishing efficient working relationships with those in his unit, military law is comprehensively covered. A small number of hours are devoted to basic orientation on military correspondence, maintenance of individual record files, and to property responsibility. Because of incidents which have occurred during the Korean action, familiarization with weapons and problems of combat are taught with emphasis on defense against guerrilla activities. This instruction on subjects of importance to all officers develops confidence in the student.

The next step is an orientation on military medicine in general. Members of the Medical Service must have a knowledge of the areas of professional and related administrative procedures which require particular emphasis or accent in military situations. It is carefully pointed out that there is little difference between good professional and medical administrative practices in a civilian institution and in a military installation, but because of the inherent nature of military operations certain precepts, doctrines, and practices are essential. The similarities and differences between civilian practice and military medicine and the duties of a medical officer are clearly defined.

Selection procedures and physical examinations are presented with emphasis on conservation of public funds. Recent advances of a professional nature applicable to military situations, such as a résumé of the latest information concerning treatment of shock and use of blood and blood substitutes, are explained. A planned program on the use of forms, records, and reports common to the Medical Service and Department of Defense agencies is presented.

Of the total number of 156 instructional hours in the course, 31 hours are devoted to preventive medicine. Field sanitation is covered with demonstrations of the latest means and devices for conserving health under situations such as those encountered in Korea today. In the instruction in preventive medicine, every student takes part in a practical exercise and writes the sanitary orders for a simulated troop movement to a newly established base in Korea.

Fifteen hours of instruction are devoted to the medical aspects of atomic warfare, and additional time is devoted to orientation on biological and chemical warfare. Emphasis is placed on the preventive and corrective measures necessary in case of ABC warfare attacks. Air Force procedures in medical rehabilitation and on military neuropsychiatry are explained.

Whether or not a medical officer becomes a flight surgeon, he will be concerned and involved in endeavors contributing to the effective care of flyers. This third area is essentially a basic orientation in aviation medicine. A brief but comprehensive survey, it includes aviation physiology, air evacuation, the aircrew effectiveness program, and functions of the flight surgeon, together with current problems of research in aviation medicine. Responsibilities of the Medical Service in aircraft accidents and in problems of industrial medicine are discussed.

A résumé of the organization of all units of the Air Force Medical Service and the current status of medical facilities is given all students. The employment of medical units under combat conditions and the air-transportable 36-bed dispensary are realistically demonstrated. These procedures show the medical officer how aviation medicine provides effective health conservation of air power. The necessary qualifications for board certification in aviation medicine, which was recently authorized, and advantages of a career in this field are presented and described.

In the latter part of the course, sectionalized instruction periods for each of the 6 different officer components are held during which the duties and responsibilities of each corps are described. Topics, presented with the specific approach necessary for the orientation of each technical component, include: (1) hospital and dispensary procedures, (2) medical records and reports, (3) medical boards, (4) medical service in a theater of operations, and (5) special responsibilities of each corps or component of the Air Force Medical Service team.

This sectionalized instruction provides for the correlation of the 6 technical and professional components comprising the Air Force Medical Service and includes a candid explanation of the interrelationship necessary for an integrated and efficient military team. Specific duties and responsibilities of the medical officer in the performance of mass physical examinations, and maintenance of clinical records are discussed. The functions of the Dental Corps and the purposes of dental records and dental identification are explained. The work of the Veterinary Corps in the subsistence inspection program is outlined. Professional ethics of women in the Medical Service is covered for the female components. Medical Service Corps Officers receive instruction pertaining to their support of professional officers. Advantages of careers in the various corps, their interrelationship and duties in combat theaters are included.

In addition to the precourse processing and orientation during the first 7 days, students are invited and encouraged to seek advice from any member of the staff at personal counseling

periods during which the class supervisor plays a most important role. He is able to answer most questions and to assist in solving the usual problems, but uses the resources of the Air University at nearby Maxwell Air Force Base for help when required.

As the course draws to a close, special effort is directed toward providing individual preparation for duty assignments. All personnel scheduled for overseas assignment attend informative briefings on health conditions in specific areas which are conducted by staff officers who have recently returned from overseas theaters. A complete file of data on various medical facilities throughout the Air Force is maintained for consultation by students.

TABLE 1. *Distribution by Medical Service component of officers who have graduated from the officers indoctrination course, Gunter Branch, U. S. Air Force School of Aviation Medicine*

(5 March 1951 - 2 May 1953)

Component	Total
Medical Corps	1542
Dental Corps	851
Veterinary Corps	104
Nurse Corps	1091
Medical Service Corps	428
Women's Medical Specialist Corps	35
USAF officers not in Medical Service	2
Total	4053

Throughout the indoctrination course we try to impart to the newly commissioned medical officers what might be called a philosophy of service medicine. We endeavor to convey the idea that their personal relationship with the patient should be carried over into military service. It is emphasized that an airman does not report at sick call to get out of work but is a patient who believes he is ill, and is the same type of patient that they might see in their civilian practice. He is treated with respect and consideration in civilian life so why should he not be so treated in the service?

Some will not agree with our attempts to influence these physicians to modernize the grand ward rounds but we point out

that military patients have sensitivities and can be damaged mentally and psychologically by such a medical school anachronism. We emphasize how much more value can be derived from consultants' visits, and picture the idea of grand rounds being held in privacy with available data at finger-tip reach, during which the patients are brought in and presented only for examination and questioning.

TABLE 2. *Distribution of physician graduates in medical specialties*
(5 March 1951 - 2 May 1953)

Medical specialty	Number certified by specialty board	Number qualified for board certification	Number with "D" rating in specialty	Total
Internal medicine	3	86	167	256
Pediatrics	1	58	60	119
Psychiatry	–	36	57	93
Pathology	1	5	25	31
Radiology	5	7	9	21
Neurology	1	5	7	13
Dermatology	2	1	5	8
Industrial medicine	–	1*	7	8
Preventive medicine	–	6	2	8
Pulmonary diseases	–	–	5	5
Physical medicine	–	–	1	1
Gastroenterology	–	–	1	1
Totals	13	205	346	564

*Industrial medicine is not represented by a specialty board.

Emphasis is placed on the importance of medical records in the service and the attitude of the specialty boards and the American Medical Association toward accomplishing this function in a superior manner. It is pointed out that military medical records come under the scrutiny and purview of the American Medical Association, even though some forms may be different from those used in civilian life. It is emphasized that Department of Defense Form 408 is solely for personal convenience to assist one in keeping a record of his service duties and training. It is pointed out that this form is accepted by the specialty boards as a record on which to base the amount of credit which may be granted for this training. Each physician is given this form and the regulation which explains its use.

There is always considerable interest in the instruction devoted to career possibilities in the Air Force. It is given with the purpose of presenting the attractive features of such a career as well as to induce the physician to look upon his 2 years in the service as an opportunity for professional advancement. He is given information on the availability and types of service rendered by the Armed Forces Medical Library, the Armed Forces Institute of Pathology, and the Armed Forces Medical Publication Agency.

TABLE 3. *Distribution of physician graduates in surgical specialties*

(5 March 1951 - 2 May 1953)

Surgical specialty	Number certified by specialty board	Number qualified for board certification	Number with "D" rating in specialty	Total
General surgery	4	70	133	207
Obstetrics and gynecology	2	38	69	109
Anesthesiology	—	20	13	33
Orthopedic surgery	1	10	13	24
Ophthalmology	2	7	14	23
Urology	—	8	14	22
Otolaryngology	4	9	3	16
Neurological surgery	—	2	3	5
Plastic surgery	—	2	—	2
Thoracic surgery	—	—	1	1
Totals	13	166	263	442

From 5 March 1951, when the first indoctrination course was held, to 2 May 1953, 4,053 officers have been graduated. Beginning in October 1952 two classes have been in session concurrently, each averaging from 150 to 200 students with 60 to 80 medical officers in each.

The distribution by component of the 4,053 officers who have graduated from the indoctrination course is shown in table 1. Of the 1,542 medical officers graduated, 536 have been general practitioners, 564 have had training in medical specialities, and 442, in surgical specialities. Table 2 indicates the medical specialities of physician graduates and table 3, the surgical specialities. The "D" rating as shown in these tables is the initial or lowest level of specialty proficiency in the military

service, and identifies medical officers who have completed a minimum of 1 year of an approved residency or fellowship or who have had sufficient practice limited to the appropriate specialty to be acceptable to the specialty board as the equivalent of 1 year of formal training.

SUMMARY

In the Air Force Medical Service Officer's Indoctrination Course emphasis is placed on methods for effectively accomplishing the transition of physicians from civilian life into the service. The indoctrination course exists only to serve the new Air Force physician and to assist him in becoming a worthy member of the medical team with the least possible delay. Reports from world-wide air bases indicate that this transition is being effectively accomplished and that the practice of providing an indoctrination course for newly commissioned physicians and other health service personnel merits the time and expense involved.

LETTER TO THE EDITOR

To the Editor:

An article by Lieutenant Colonel Frank W. Chorpenning, MSC, U. S. Army, entitled "The Treponemal Immobilization Test (TPI) in the Diagnosis of Syphilis," which was published in the June 1953 issue of the *United States Armed Forces Medical Journal*, appears to reflect the belief that the Army Medical Service Graduate School indorses the institution of the TPI test as a method of diagnosis of syphilis by consulting laboratories.

To prevent any misunderstanding, the Army Medical Service Graduate School wishes to make clear that the opinions expressed therein were those of the author and should not be considered as being representative of the current beliefs of the staff of the Army Medical Service Graduate School.

William S. Stone
Colonel, MC, USA
Commandant

PLASTIC EAR STENT FOR HEARING AIDS

HERBERT J. TOWLE, Jr., *Commander, DC, USN (1)*

JOHN V. NIIRANEN, *Commander, DC, USN (1)*

AN EAR stent developed by the authors promises to meet a variety of needs, particularly the growing demand for greater comfort in the wearing and use of hearing aids. The factors which have focused attention on hearing-aid comfort are (1) recent developments in hearing-aid engineering with their consequent modifications in hearing-aid design, and (2) the rapid increase in the number of persons using hearing aids.

Hearing aids may be divided into air-conduction and the bone-conduction types, either of which may function through mechanical or electrical means *(2)*. Mechanical methods employ the force of sound waves and natural or mechanical means for amplification. Electrical methods gain amplifications through the power of an electric current.

The "collector" or "ear funnel" is the oldest air-conduction type *(2)*. From time immemorial the cupped hand held behind the ear has been used as an aid. The first mechanical means devised to help those with impaired hearing was the "ear trumpet." It was nothing more than a reducing horn, the large area of the horn collecting the sound waves and concentrating them at the external auditory meatus. Through the years these horns were refined and made more compact by twisting and turning the long reducing horn back and forth within the collecting bell. A telescopic horn, easily carried but rather formidable when opened, was a further modification. The "apparitor auris" with a small silver tube extending in the depth of the ear, and the "London dome," a small and efficient apparatus carried in the palm of the hand and held up to the ear without attracting much attention, were further refinements *(3)*. Both of these were objectionable because they caused irritation in the external auditory canal. The literature reveals that most aids which extended into the external canal were a continued source of irritation. In this con-

(1) U. S. Naval Dental School, National Naval Medical Center, Bethesda, Md.

(2) Niemoeller, A. F.: Handbook of Hearing Aids. Harvest House, New York, N. Y., 1940.

(3) Fridenberg: Mechanical aids to hearing. Ann. Otol., Rhin. & Laryngol. 20: 138-143; 182-190, 1911.

nection, various early attempts to restore the drum by the mechanical use of a pledget of cotton (which was the most successful), precious metal foil, or parchment paper were often followed by serious infections and sometimes fatal results *(3)*.

Another type was the speaking tube which was a "conserver" rather than a "collector" of sound waves. The speaker talked directly into a long flexible tubing which led to the impaired ear. The microphone was a small flat box with a delicate film of flexible metal which the air waves set in vibration and was held close to the ear. This principle, with the addition of a secondary battery, was later used in the telephone *(3)*. In 1884, Dr. Alexander Graham Bell described experiments at the Volta Laboratories indicating the applicability of the telephone principle to persons with impaired hearing, but it was not until almost 1900 that the first commercial instrument was made by the Akouphone Company, of Mobile, Ala. Mears' "aurophone" of the same era had a headpiece as the receiver and microphone for the ear *(3)*.

The idea of a bone-conduction type of aid was first mentioned by Ingrassia, a Sicilian who died in 1580, who suggested the possible conduction of sound waves through the teeth. In 1757, Jorissen, a German, recommended the use of a wooden rod with one end held between the teeth of the speaker and the other end similarly held by the listener. A few years later Buchner, also a German, wrote of a man in Copenhagen so deaf that he was unable to hear the sound of a cannon shot off while standing alongside it, but he could understand a sermon by holding a long wooden stick between his teeth while resting the other end against the pulpit. Beethoven, after becoming deaf, discovered that he could hear music by resting a wooden rod against the side of his head, or between his teeth, while the opposite end was against the piano *(2)*. The first practical application of this principle was in 1879 when Rhodes patented the "audiphone," a fanlike device of stiff cardboard or celluloid. The edge was held between the teeth while the fan was bowed outward toward the source of the sound. The area of the fan acted as a collector of sound waves which it transmitted to the teeth, jawbone, and skull, and thence to the nerves of hearing. Soon after, Graydon introduced the "dentaphone" and Thomas, the "osteophone" *(2)*.

The "ossiphone," the first commercial electric bone-conduction aid, was devised in 1920 in London. The first American instrument of this type, called the "osophone," was manufactured in 1923 by Gernsback. It was not until 1932 when Lieber of Sonotone Corporation introduced his instrument, that any satisfactory degree of efficiency was obtained *(2)*.

Improvements of electrical hearing aids have been made within the last decade. At the beginning of World War II, electronics

probably led the field in progress and in development, and electric hearing aids were benefited by improvements in vacuum tubes and batteries. There are now between 30 and 40 manufacturers of hearing aids. A list of accepted aids by the American Medical Association may be obtained from the Council on Physical Medicine, 535 North Dearborn Street, Chicago 10, Ill. By the use of different receiving units, the devices may be adapted for air or bone conduction (4). Each consists of: (1) a trans-

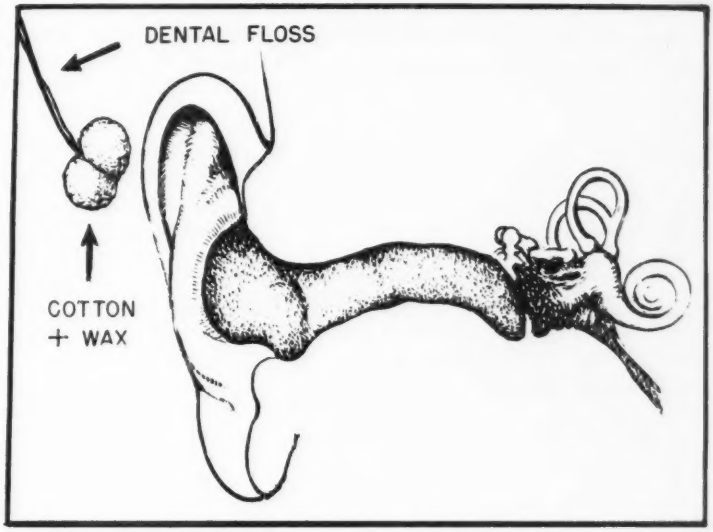

Figure 1. Pellet ready to insert into canal.

mitter which picks up sound waves and converts them to electrical impulses; (2) a receiver which converts electrical impulses (sometimes magnified by an amplifier) back into sound waves; (3) a dry cell battery which furnishes the operating power of the system; (4) cords which connect the parts of the system; and (5) an amplifier, either of the carbon or vacuum tube type, with a regulator to control amplification, which magnifies the electrical impulses (2).

The increased effectiveness of hearing aids and the changes in hearing-aid design have encouraged increasing numbers of people to give them a trial. In 1943, about 110,000 sets were purchased; in 1946, more than twice that number (225,000) were sold (5). An increase of over 100 percent in a space of 3 years

(4) Riis, R. W.: Hearing aids win new popularity. Hygeia 25: 188, Mar. 1947.
(5) Berry, G.: Hearing aids; evaluation and practicability of hearing aids, with review of recent literature. Ann. Otol., Rhin. & Laryngol. 57: 500-508, June 1948.

is significant. It was estimated that in 1948 there were 800,000 hearing aids in use and that the average age of the purchaser was 55 years. Manufacturers estimate that more than 1 million persons in this country are wearing such aids and that 4 million others would benefit from using them.

With rapid developments in engineering design and with the number of users increasing constantly, the factor of comfort for the wearer has been assuming greater importance. The development of an ear stent fabricated to meet the needs of the individual offers a promising method of providing complete comfort for the wearer of a hearing aid. Fabrication of the stent is not difficult and can be accomplished by a dentist using the following technic:

Assembling materials. The impression procedure requires materials which are available in most dental offices: a small plaster bowl, plaster spatula, alginate impression material, cotton, dental floss, baseplate wax, beeswax, wax spatula, and a burner.

Preparing the patient. The patient is placed on a table lying on his side in a comfortable position with the ear to be fitted upward. The canal is carefully cleaned of any debris or wax by a cotton-covered applicator.

Preparing for taking the impression. A piece of dental floss is tied around the middle of a pellet of cotton about the size of a

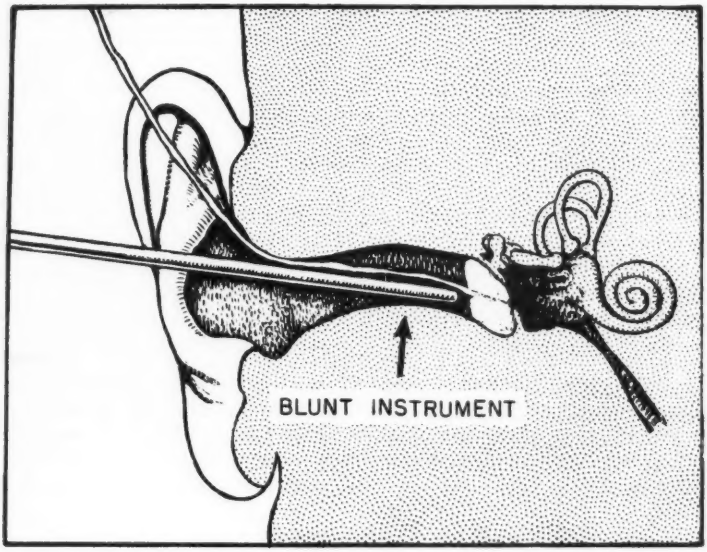

Figure 2. Pellet in place against tympanic membrane.

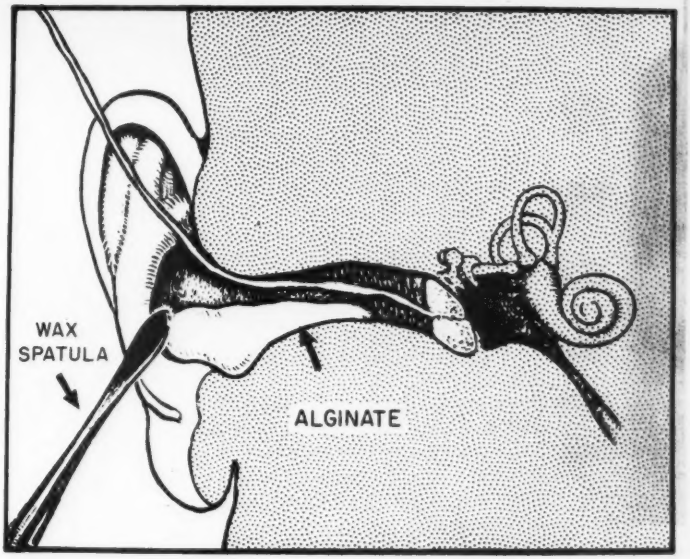

Figure 3. Applying impression material.

dental cotton pellet. Wax heated in a spatula is touched to the cotton, which becomes saturated. While the wax is still warm, the cotton pellet is gently pushed by a blunt instrument into the canal to the proper depth (figs. 1 and 2). The excess dental floss is deflected from the field of operation.

Taking the impression. One-half unit of alginate impression material is mixed according to the manufacturer's directions. The mixture is permitted to flow down the side of the canal, using gentle force if necessary. Care must be taken not to trap air in the canal (fig. 3). An excess of material is poured around the external surface of the canal to facilitate removal of the impression and to obtain an accurate adaptation of the external portion of the ear insert.

Removing the impression. The tissues in contact with the impression material are gently pulled away, and the impression is removed by putting tension on the dental floss and on the mass external to the canal. A steady pull will remove the impression intact (fig. 4).

Preparing the impression. The wax-impregnated cotton is blended carefully to the alginate impression material by flowing wax to form the bond. A thin layer of wax is flowed over the entire surface of the alginate impression that will contact tissue. This is to compensate for final polishing and to fill in any small artifacts (fig. 5).

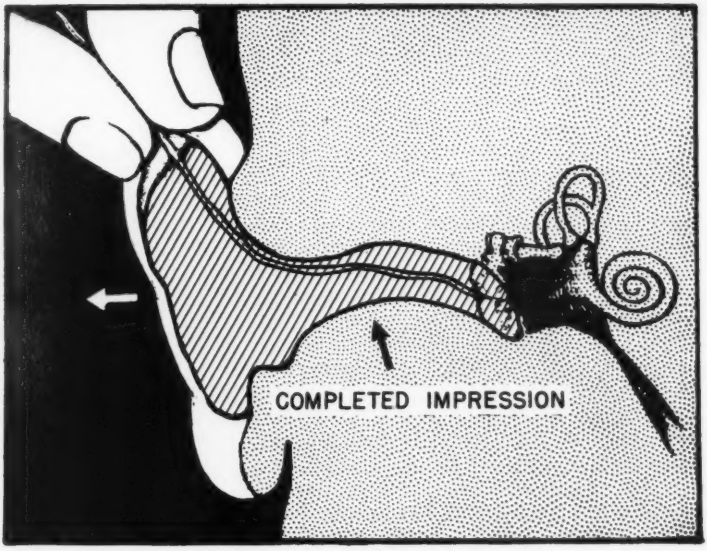

Figure 4. Removal of the impression.

Investing the impression. Dental stone is mixed and agitated into the bottom section of a crown and bridge flask. Additional stone is also poured over the prepared impression surfaces that will be embedded in the stone of the bottom section and agitated. The impression is then set in the stone, leaving the flat external

Figure 5. Blending pellet with impression.

portion with the female metal insert, which is part of the hearing aid, flush with the surface of the stone (fig. 6). After the stone has set, the bottom section of the flask is painted with a separating medium. The top half is set on the lower section in such a way as to provide clean metal-to-metal contact of the adjoining surfaces. Stone is mixed and agitated into the upper half until the flask is full; then the stone is allowed to set.

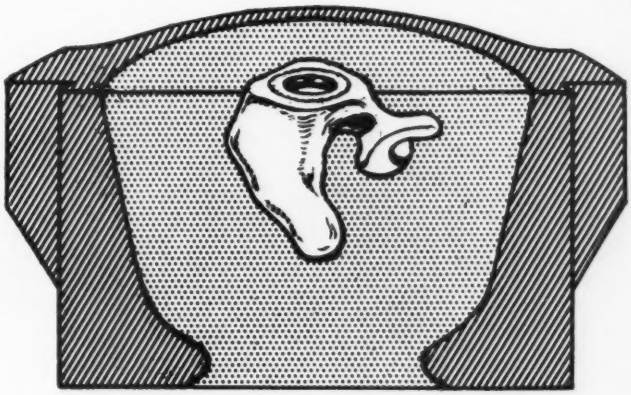

Figure 6. Impression set in dental stone.

Packing and processing. The two "halves" of the flask are separated and the alginate pattern removed mechanically. Hot water is flushed into the mold to remove all traces of wax or alginate particles. The mold is dried and coated with an accepted substitute for tin foil.

Clear methyl methacrylate polymer and monomer are mixed according to the manufacturer's instructions. The dough is ready to pack when it no longer will adhere to a clean steel instrument. Contaminating the mixture is to be avoided at all stages. The lower half of the flask is overpacked, so that when the flask is pressed together with moist cellophane between the two halves, the excess forms "flash." The "flash" is removed and the flask is closed again with the cellophane in place. This procedure is repeated until no "flash" remains. The flask is put into a press and is ready for curing. Still in the press, the flask is put in a water bath at room temperature with the water level above the top of the flask. The temperature of the water bath, which is thermostatically controlled, is raised approximately 1.8° F. per minute. The bath is allowed to boil for 30 minutes before the flask is removed. The flask is next immersed in cold water for 15 minutes and then dismantled.

Finishing and polishing. Any "flash" and protruding defects are trimmed off with mounted stone, care being taken to avoid altering the original contours. The "auditory" canal is cut through the plastic material with a large, round bur in a straight handpiece (fig. 7). The "canal" is finished and smoothed with stones and with string impregnated with pumice. For final polishing,

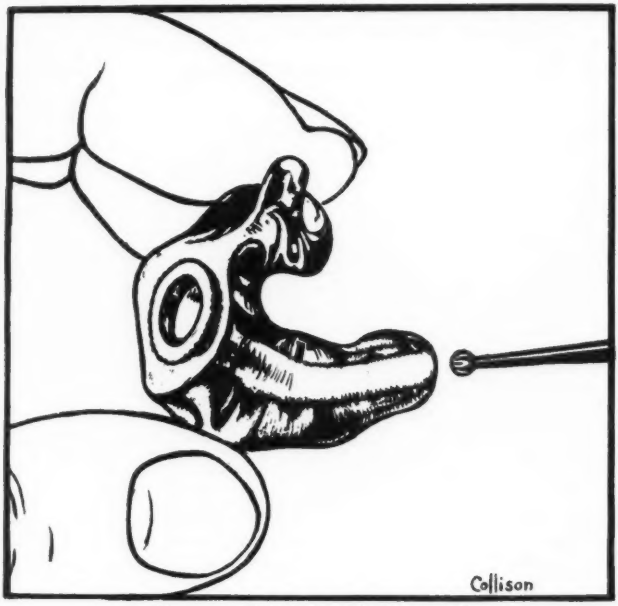

Figure 7. Cutting "auditory" canal.

a soft ragwheel is used with wet flour pumice under light pressure. The engine is run at slow speed to avoid "burning" the surface of the acrylic. The irregular surfaces are similarly polished, but with felt cones and fine bristle brushes. A high surface polish is imparted with dry ragwheels, cones and brushes, and whiting.

SUMMARY

Comfortable plastic stents (or inserts) for hearing aids can be made by using the technic described. The individualized prosthesis is accurately adapted to the ear canal, so that there are no irritating pressure points. The material used is practically indestructible. Scratches, or etching by organic solvents, can be removed by polishing. This precisely fitted stent promises greater comfort to the increasing number of wearers of hearing aids.

PROSTHETIC DENTISTRY AT A REPLACEMENT CENTER

WILLIAM D. LOVE, *Major, DC, USA (1)*

THE most difficult part of Army dentistry is to provide adequate dental treatment to a maximum number of patients with a minimum number of dentists. This problem is present overseas and in the zone of the interior, and is not likely to end in the near future. It is necessary that the Army Dental Corps adapt itself to this situation and somehow arrive at a logical method for coping with it while maintaining our high standards of dentistry. One phase of this problem is prosthetics.

As chief of the Dental Prosthetic Service at this station for the past 2 years, I have come to know the sorrows and aggravations of attempting to give dental attention to an overwhelming number of patients. A large percent of the 20,000 troops here are transient, with periods of duty varying from 1 week to 9 months. Thus the dental problem never ends, for as fast as one group is treated, another takes its place. Most of the men attending the Schools or in the Replacement Center are doing so as a preliminary to overseas shipment. Consequently, the class 4 restriction on overseas shipment places a tremendous burden on the Dental Service to enable the men involved to meet the requirements of having sufficient teeth to masticate the Army ration.

Dental facilities consist of a 25-chair clinic (with an additional section built onto it to house the Station Dental Laboratory), a 15-chair clinic connected with the hospital, and a physical examination section. Of the 35 dentists assigned, 3 are assigned to prosthetics, 1 to the 15-chair clinic and 2 to the 25-chair clinic. Two laboratory technicians are assigned to the smaller clinic to pour casts, prepare bite rims, do articulations, and most important of all, do the crown and bridge prosthetics for that clinic. The main laboratory consists of 11 technicians, 10 of whom had never been in a dental laboratory up to a year ago. The latter, graduates of the Dental Laboratory Technicians' School at Brooke Army Medical Center, through their performance have reflected the careful selection and outstanding training the School is providing in a 16-week course. Every one was well grounded in all laboratory technics and required only guidance and further experience to develop into excellent technicians.

(1) Engineer Replacement Center, Fort Belvoir, Va.

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Although these problems and conditions are common, I want to show what steps have been taken to cope with them here in the hope that others will write of the methods they have developed to solve the same problems so that a logical, standardized solution may be reached.

The primary mission of the Dental Corps is to maintain the dental health of the Army and we must decide from a prosthetic viewpoint how this mission can best be accomplished. We must compromise because with the relatively few dentists maintenance of complete dental health in all soldiers is impossible. This is particularly true in a replacement center where 230 new men arrive every week, 50 percent of whom are in class 3, 4, or 5. Added to this are the requirements of the schools and permanent personnel. It follows that replacing every missing tooth would result in complete pandemonium.

Therefore, the first rule we made was that only those patients in class 4 would receive dentures. This causes a certain amount of dissension in some patients but, when time is taken to explain the reasoning behind it, they too see that the ruling is justified. As soon as this is decided, the question arises as to who is in class 4. The Army regulation defines a patient in this category as anyone unable to masticate the Army ration. It is impossible to make a certain number of opposing posterior and anterior teeth the deciding factor because, as we all know, ability to masticate with a certain number of teeth varies greatly. Some are more adaptable to change. Others, who have for one reason or another been missing a great number of teeth for several years, have learned to get along well with what they have. A man must have a definite incentive to wear dentures, particularly when they cost him nothing. They must either greatly improve him esthetically or he must notice an almost immediate improvement in his ability to chew, otherwise he soon forgets to put them in his mouth. We have not improved his dental health simply by making dentures for him and have probably denied someone else the opportunity for dental care. Thus for proper classification, careful analysis of each patient must be made at the outset.

This is accomplished at our station in the following manner. When the patient is first seen in the clinic examining room he is temporarily placed in class 4 if he has less than 3 posterior opposing teeth or if he specifically requests replacements. Full-mouth roentgenograms are ordered and he is given an appointment with the prosthetics section for consultation. The operative and surgical sections receiving a request for replacements screen the man more thoroughly and, if they believe replacements are possibly justified, send him for full-mouth roentgenograms and appointment to the prosthetic section. Two morning hours are reserved biweekly by the prosthetic officer or officers for con-

sultation. Sufficient time is provided for careful analysis of each patient. Here, the number of teeth is not considered, but rather whether replacements will or will not materially improve dental health. A sheet of paper cut to size is attached to the dental record and a short history taken. Further pertinent comments are made either for or against denture construction. If the patient is deemed to have sufficient teeth this and the fact that he does or does not agree is noted. Careful explanation of our reasons for a certain diagnosis almost always results in a favorable reaction. For those requiring dentures, an attempt is made to foresee which teeth must be removed for good denture construction. By deciding on which teeth must be removed before rather than during dental treatment, the patient is more easily convinced that we are attempting to be of service to him. Carious exposures detected during operative procedures may necessitate the loss of more teeth, but he can easily appreciate that this is an unforeseen circumstance. Teeth requiring special restorations for better denture placement are noted although the philosophy of "the best dentistry for the most people" limits this somewhat. Wherever possible, endodontia rather than extraction is resorted to for the anterior teeth. We believe that not only the patient benefits but the time required is much less than that needed to remove the tooth and construct a bridge.

With regard to anterior tooth replacements, most dentists agree that a well-placed fixed bridge is far superior to a removable partial denture, except in a few select patients. Consequently, when only anterior teeth are involved, we either construct a fixed bridge or nothing at all. In the long run, the patient's dental health will benefit more by our having the courage to refuse him temporary partial denture replacements. When his training period is completed and he obtains a permanent assignment, sufficient time will then be available to give him the bridge which he needs. Although it is not his fault he is being moved so rapidly, neither is it ours, and I don't think we should compromise good dentistry because of it. Therefore no man is held from overseas shipment for missing anterior teeth. A year on a prosthetic truck in World War II convinced me that bridge construction is available almost into the front lines of combat. I do not wish to leave the impression that the man without anterior teeth is neglected. If he is to be here at least a month and has healed sufficiently he is given a series of appointments and a bridge is completed.

On completion of the diagnostic period, treatment is discussed with the patient and he is given a registration date which is noted on his dental record. This date varies depending on healing time, time remaining at this station, necessary operative procedures, and other variables which enter into favorable denture construction. A registration book is kept with each page repre-

senting a date, and the patient's name, rank, and unit are listed on the appropriate page. Those requiring full dentures are referred to the surgical section if necessary, while those needing partial dentures are referred to the operative section where sufficient appointments are given to allow complete restoration of the teeth that are to remain. The first appointment is usually in 2 or 3 weeks because of the operative workload, and in the intervening period necessary extractions can be accomplished. An operator accepting a patient assumes the responsibility to see that the operative work is completed by the listed registration date.

Each day one of the prosthetic assistants checks the registration book and calls in all patients listed for that particular day. Except in a few instances when operative findings necessitate a change in diagnosis, only a few minutes is involved in checking to see whether the mouth is ready for impressions. Thus these patients can be worked in without a formal appointment and time is saved in not having a man arrive for his impression appointment before his mouth is completely prepared. We require that all operative work be completed in both jaws before any denture construction is started. It is much better for a patient of this type to be held from overseas shipment and his dental treatment completed once and for all than to send him on his way with a mouth that will need reconstruction again within a few months. For all practical purposes, this limits operative procedures for transient personnel to those in class 4. Permanent personnel are regularly surveyed and treated to include all classes. Therefore we believe that transient personnel would be afforded the same opportunity when they are permanently assigned whether overseas or in the zone of the interior.

If the mouth has healed sufficiently and the operative work is complete, an appointment for an impression is made. These appointments are restricted to a certain definite number each day so that an even flow of work to the laboratory is provided. This requires making appointments for 2 or 3 weeks ahead but this disadvantage is more than offset by the fact that the laboratory workload is kept on an even keel. Rush periods, which are the cause of much poor denture construction, are minimized.

Much time and care are taken at the impression appointment to get as ideal an impression as possible. Minutes here save hours later in adjustment. For partial dentures, well-defined rest seats are prepared throughout the mouth as necessary. For a rest to function properly, the rest seat must be prepared according to established standards, whether the tooth involved has a restoration in it or not, otherwise any preparation is useless. Results observed in most mouths subjected to partial dentures without rests give the impression that stations constructing them are in

the main getting around the class 4 restriction rather than caring for the patient's dental health. In the impression procedure, we have found controlled water temperature, the use of distilled water, and arriving at a definite time of set makes for better-fitting dentures besides eliminating remakes which are most annoying when every minute is precious. By using a timer and referring to the manufacturer's directions for time of set we were surprised at how far off our estimated time had been, and were rewarded with much more precise fitting of our partial castings. In addition, by eliminating variables, setting time from mix to mix changes only slightly. Trial and error will thus produce a uniform setting time suitable to any given operator.

Partial denture construction at replacement center level, due to workload, has always presented the problem of whether to use wrought bars and wire as a framework or to attempt complete castings. With the advent of preformed wax and plastic patterns and their inclusion in the Armed Services Catalog of Medical Materiel, cast frameworks can be produced almost as rapidly and with as much ease as wrought work. The superior strength, fit, and esthetic results make this little extra time well worth while. Careful screening of prospective patients with subsequent reduction in the number of partial dentures constructed allows for any extra time necessary. Benefit to the patient in service and to the Army and Veterans Administration in remakes throws the balance far over on the side of the casting. Surprisingly enough, tests conducted at the Central Dental Laboratory at Walter Reed Army Medical Center showed that the cost and time factor for casting procedures was closely comparable to that for wrought-wire fabrications. This included cast palatal bars and horseshoes for partial upper dentures as against full acrylic palates with wrought clasps. Consequently, I believe wrought-wire dentures, except when indicated in a few patients, should become a thing of the past in Army dentistry. Up to May 1952, we followed this line of thinking and cast all frameworks in gold. In May 1952, the Walter Reed Laboratory started using chrome-cobalt for all castings in lieu of gold. It not only was much cheaper but also produced a vastly superior framework. The one contraindication of too great clasp rigidity was overcome by locating a commercial product demonstrating almost as great clasp elasticity as cast gold. I have adjusted well over 100 of these with no greater a breakage ratio than with cast gold. When it is believed that greater resiliency is needed to protect a weakened abutment, 18-gage round wire for the retention arm can be incorporated into the casting as is done with gold.

Due to the added equipment and experience needed for this work, accomplishing it at the station laboratory level was and is not feasible. Thus we instituted a system with the co-operation

of the Walter Reed Laboratory whereby we design and block out the master model and send it to them for casting. The bare casting made to our specifications is returned and we complete the case. This has worked out very satisfactorily in that a minimum of Central Dental Laboratory time is used with the best result for us. Our technicians can now be concentrated in the setup and finish sections, resulting in greater workload ability with no reduction in quality. Other stations in this area are being provided the same service and I am sure any other central dental laboratory would be willing to do the same thing for its stations. If this service is not available, the cast gold framework would still provide a very satisfactory denture.

Little has been said about full dentures because they do not present the administrative problems encountered in making partial dentures. There is no question as to who should be treated; if a man has *no* teeth, he needs treatment. We encourage transient personnel with ill-fitting full dentures to await assignment to a permanent station. Appointments for full denture construction vary slightly from those for partial dentures in that we give each patient all of the necessary appointments at his tray impression sitting. Thus, once started, he receives his dentures in the shortest possible time rather than being put off because of a full appointment book.

The most important sitting for any prosthetic patient is the insertion sitting, and observation has shown that it is the one most neglected by the dentist. Here, years can be added to the life of the denture by taking a few minutes to explain its pitfalls, its capabilities, and, most important, care of the denture and the mouth. From the time a patient is admitted to the clinic until his mouth is rehabilitated, care of the mouth is stressed by all operators. The reasons for it and the benefits derived are gone over again and again. Thus by the time dentures are inserted, the mouth is in good health and ready to receive them. I realize that some of the dentures we inserted are worn for a short time and discarded. This is inevitable in a "free" service no matter how carefully the patients are selected, but, if we have convinced the man of the necessity for oral care, both he and the Army have been benefited. Consequently, after the denture is inserted and the occlusion carefully adjusted, oral care is again discussed stressing 2-minute brushing *by a clock*. The fact that the gingiva and the tongue as well as the teeth require stimulation is pointed out. The reasons for removal of partial dentures at night and full dentures for an hour a day are also explained. All directions are kept as simple as possible. A confused patient or one who concludes that oral care is going to take up a great deal of time will neglect his mouth or, at best, go on as he was doing previously. This is particularly true of the young man to whom most of our time is devoted.

The satisfaction derived from seeing a patient who is a prospect for a denture enter the clinic disinterested in his mouth with its consequent neglect and deterioration and seeing him leave a few months later with his mouth restored to health and seeing him make a definite effort to maintain it is worth all the time devoted to him. This feeling of achievement must be attained if continued work under the present adverse conditions is to be tolerable. The methods described may not all be applicable at other stations, but if they provide a starting point for better denture service my objective will have been reached. The Dental Corps has constantly striven for improvement since its beginning 52 years ago. Let us hope that even with the tremendous problems facing us we can continue that trend in the future.

Exhibits on Military Medicine Win Awards at AMA Meeting

At the Annual Meeting of the American Medical Association, held in New York City 1 to 5 June 1953, 13 exhibits from the Army, Navy, Air Force, and the Armed Forces Institute of Pathology were presented in the Section on Military Medicine, of which Capt. R. V. Schultz, MC, USN, Washington, D. C., was section representative. Certificates of Merit for the exhibit on amphibious and field medicine were awarded to Capt. E. R. Hering, MC, USN; Lt. Comdr. F. J. Lewis, Jr., MSC, USN; and Lt. C. M. Smythe, MC, USN, Camp Lejeune, N. C. Honorable Mention for the exhibit on medicine and research in diving went to Lt. (jg) E. H. Lanphier, MC, USN, Washington, D. C.

PUBLICATIONS BY OFFICERS OF THE MEDICAL SERVICES OF THE ARMED FORCES

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THE CLINICAL RECORD

As an Index to Quality of Medical Care *(1)*

ROBERT A. BELL, *Captain, MC, USN*

THE quality of medical care is of prime concern to the practicing clinician and should be of no less concern to those who are entrusted with the administration of our Federal hospitals. The basic ingredient of high-quality medical care is provided by the person with well-organized thoughts, analytic ability, and sound judgment. These factors, combined with a genuine interest in the problems of the patient, and a bent for intense and concentrated effort, cannot be dispensed with if patients are to receive the best possible medical care. The medical record in general, and the clinical record in particular, can only serve as adjuncts to these basic factors in providing medical care. The record can save the time and energy of the clinician, and the Cornell Indexes are good examples of what may be accomplished in this area.

The Cornell Medical Index affords a comprehensive appraisal of the patient's medical history at no expense of the physician's time and provides replies to a long series of questions which tend to be omitted from routine medical histories. From the viewpoint of time alone, the physician can hardly hope to ask and record the results of the many questions which are necessary if he is to gain a proper perspective of the functioning of the various body systems. It is difficult in today's era of specialization for a clinician to maintain the interest in all body systems which is needed to enable him to remember to ask all of the pertinent questions.

It may be well here to review some of the work which has been done in the standardization of medical records in the Federal Government. At present, 2 standing committees are functioning in this area. These are (1) the Interagency Committee on Medical Records formed in 1946 by the Bureau of the Budget on request by the President that steps be initiated to carry out certain of the recommendations of the Committee on Integration of the Medical Services of the Government *(2)* and (2) the Interdepartmental Committee for Standardization of Forms. The Interagency Committee deals with forms which pertain to military and nonmilitary agencies, whereas the Interdepartmental Committee considers forms used within the Department of Defense.

(1) Presented on 20 April 1953 to The Sixth Interagency Institute for Federal Hospital Administrators at the National Naval Medical Center, Bethesda, Md.

The Interagency Committee initiated its work with a study of the medical examination forms in use by Federal agencies. As a result, the Standard Forms 88, 89, and 90 were revised. These forms are in widespread use in the Armed Forces today, and they not only aid in standardizing medical histories and physical examinations from a physical fitness viewpoint but provide information in the medical records which continue with the serviceman and may improve the medical care which can be afforded him.

The second class of medical records studied by the Interagency Committee was the clinical records in use by Federal hospitals. The first series of forms in the clinical record series were submitted to the Bureau of the Budget early in the summer of 1948. These forms were approved by the Bureau of the Budget and promulgated as standard forms by Circular No. A-32, 26 August 1948. Included in this series are Standard Forms 501 through 521. The series was confined largely to those required for the care of general medical and surgical patients in a hospital. The Committee continued its work on clinical record forms with the development of forms for patients requiring specialized medical care. After reviewing a large number of such forms in use by Federal agencies and by private hospitals, the Committee decided to restrict its recommendations to a rather limited number of forms. With the exception of certain forms in rather wide use in Federal hospitals, the Committee believed that specialized clinical record forms should be standardized only on the request of hospitals actually using the forms. The Committee submitted certain additional clinical record forms to the Bureau of the Budget and these were promulgated by Circular No. A-32 Revised, 30 March 1950. This circular promulgated Standard Forms 522 through 539. The Committee does not plan to recommend any additional clinical record forms for standardization unless specifically requested by some Federal agency.

One of the forms, the Narrative Summary Form, Number 502, provides for a summarization of the pertinent or important portions of the clinical record and, when filled out, it may be used for incorporating the essential data in the health record. The completion of this form in duplicate at the ward level permits a corresponding reduction in clerk-typist help in the Central Records Office without any detraction from the completeness or adequacy of the health record entry. The introduction of dic-

(2) The Committee on Integration of the Medical Services of the Government was appointed in December 1945 by the President and was charged with the responsibility of reviewing the medical care provided by various governmental agencies and submitting recommendations for the improvement in such services and for changes in basic policy, if necessary. This Committee in submitting its report in May 1946 had specifically recommended, "That a joint committee of representatives of the Veterans Administration, Army, Navy, and Public Health Service be appointed to study and make recommendations on a common system of medical records and disease nomenclature."

taphones or wire recorders in the ward doctors' offices is saving many professional man-hours of work and results in a more complete and readable clinical record than was the case when the physician wrote the entire record in longhand. In some hospitals a stenographic unit or general pool is being used whereby the physician picks up a telephone and, unless a red light appears showing the stenographer to be busy, he immediately starts dictating the diagnosis and summary. This avoids the tedious writing by the physician and the more tedious reading of some physicians' writing.

The Committee has also worked on the development of a standard health record for members of the Armed Services. The primary purpose of the health record is to provide a chronologic summary of the health status of members of the Armed Services which will be readily available at any time to the medical officer of the members' command and which, on termination of service, will be readily available to the Veterans Administration for use in the adjudication of claims for pension or disability. The Committee has developed 4 forms for use in the health record, and these have been approved by the Executive Office of the President and have been submitted to the Government Printing Office for printing. The forms are: (1) Standard Form 600—Chronological Record of Medical Care; (2) Standard Form 601—Immunization Record; (3) Standard Form 602—Syphilis Record; and (4) Standard Form 603—Dental Record. In addition, the Armed Services have developed a standardized health record cover which is of such size, quality, and construction that it may be substituted for the medical jacket cover currently in use in the Records Storage Offices. In the Navy, it is intended also to incorporate as a standard part of the health record the Standard Form 88—Report of Physical Examination, the Standard Form 89—Report of Medical History, and a new form, designated as the H-10, for recording on a current basis and in a chronologic order the data on successive outpatient treatments including daily sick-call entries. The value of this record in affording the medical officer with an up-to-date medical record on his patient is self-evident, and the probable value of the record to the Veterans Administration at a later date in administering veterans' claims will be readily apparent to anyone who has been connected with the difficulty experienced in providing data on sick-call treatments.

The clinical record must be a constant reminder of the thoroughness with which the physician has considered his particular patient's case. It provides the written record from which there can be checking and rechecking of the various elements in the history, physical examination, laboratory tests, therapy administered, or even of the degree of training and judgment of the clinician himself. It renders unnecessary any reliance on memory alone for

assessing all of the elements of each of these factors which are important in arriving at a considered judgment in a case. The record will reveal the symptoms, signs, or laboratory results showing any abnormalities, and a check thereof will also reveal whether the clinician has rechecked his results and taken action to confirm or disprove the findings recorded or reported as being abnormal. It will show whether (1) necessary consultations were requested without delay, (2) consultants gave timely acknowledgment to such requests, (3) full use has been made of the available formulary, (4) costly drugs were used with discrimination, (5) the effects of such drugs were evaluated constantly and the drugs stopped when they were no longer effective, (6) patients were hospitalized unnecessarily, and (7) discharge from the hospital was effected at an appropriate time. The clinical record serves as a valuable investigation and research tool, and from its proper use we can correlate signs and symptoms of disease and can collect pertinent data of statistical import.

In the Navy, Form F is used for transmitting data of statistical import to a central office when it is correlated, analyzed, and published. This includes diagnoses, injuries, poisonings, transfers, disposition of patients, et cetera. From this we obtain such important data as incidence rates, noneffective rates, morbidity statistics, and various other elements of vital statistics.

In addition, the cross-index system of summarizing data from clinical records affords a simple method of assembling series of case histories for study without any extensive personnel force. This system is intended to provide ready access to clinical data. The basic records in the system are cards for diagnoses, for surgical operations, and for special study items. The clinician merely sets up his study program and then in closing out each record he marks the data which the librarian is to set off on the index card.

Although a detailed and comprehensive record is essential and invaluable in its place, it could well be an index of a poor quality of medical treatment under certain circumstances. A system for compiling a voluminous and detailed record, if introduced in a small institution, could well require an excessive number of professional man-hours of effort for its operation without providing a compensating degree of data or an improvement in care of the patient. The record structure in a teaching institution must necessarily be more elaborate than that in a nonteaching institution, a dispensary, or an infirmary. Under ordinary circumstances, it is a waste of professional effort and of manhours to obtain and record a long detailed medical record on an uncomplicated case of common cold, of acute tonsillitis, or of plantar warts. In the exercise of good judgment in the administra-

tion of the average hospital, the medical record in these simple, uncomplicated, and relatively unimportant disabilities should be reduced to those entries necessary for the bare essentials of recordkeeping. We would be neglecting a most important aspect of clinical records administration if we failed to consider the ultimate disposition of such records.

The problem of storage space for the large volume of clinical records created each year is becoming increasingly acute. A recent study in one of the large teaching hospitals revealed that 1,258 pieces of paper were used for record purposes for each bed per year. During the calendar year of 1951, a total of 18,783,000 patients were hospitalized. Of these, 16,676,000 were short-term patients. The clinical records created each year, based on the 1951 short-term patient load, fill about 41,000 square feet of critical space. The cost in personnel, filing equipment, and space for the simple task of placing these records in filing cabinets is about $1,500,000.

In view of the statutory, teaching and research requirements for the retention of these records, the space problem as pertains to the continued storage of the records will become more acute with each passing year. It is a regrettable fact that the rapid growth of this unrestrained paper monster has, in many instances, forced the hospital records management into the use of sub-standard space for the storage of clinical records. An inadequate records-storage program causes an unnecessary waste of man-power in the searches for required case histories, and such conditions sometimes result in partial or complete destruction of the records. A reasonable solution to the record-storage problem is to place the records on microfilm and file the film in unitized cards in numerical or alphabetical system. The records will then be readily available. Of the original storage space, at least 75 percent will have been regained. There will be a more efficient use of manpower in storing records, and a sizeable saving will accrue by obviating the cost of purchasing filing equipment.

I should now like to mention the forensic medical problem which underscores the importance of the clinical record as an indicator of the quality of medical care. The malpractice or alleged malpractice suit, or the threat thereof constitutes a serious problem. Until 1946, there was no easy way whereby the patient could obtain damages from the Federal Government for acts of negligence on the part of a Government physician. In 1946, the 79th Congress enacted Public Law 601, which placed the Federal Government in the same legal status as a civilian defendant. At the time the law was passed, it was our impression that the service physicians would frequently become involved, directly or indirectly, in litigation, as a result of the law, and experience appears to have confirmed that view.

The law requires that the physician have the learning and skill of other physicians in good standing in the same locality and that he use ordinary care and diligence in the application of such learning and skill. As malpractice prophylaxis, the doctor must not only exercise a high quality of medical care, but he should also be able to prove that he has done so. His greatest aid, in this respect, is the clinical record. This should show what was done, when it was done, and it should include a complete recording of all instructions given the patient together with the written history, the record of the results of physical examinations and reports of laboratory examinations, and the progress notes. The physician cannot possibly recall all of these facts after a year or more, but the disgruntled patient is likely to remember (not always accurately) every detail and every word spoken. It is a common human characteristic to remember only that which we wish to remember and to remember what we have heard, not in the context in which it was stated, but in the context of how we interpreted it. Moreover, the patient's vivid recall of the circumstances as he remembers them is liable to sway the average judge or jury when there is a conflict between his and the physician's statements. Juries are also apt to conclude, and perhaps justifiably, that the poor record reflects laxity on the part of the physician and his management of the case.

In addition to the necessity for keeping complete and accurate clinical records, experience has shown that unexplained alterations should never be made in those records. Any alterations in the record are certain to create suspicion, unless they are explained, dated, and initialed. Also, the altered material should not be obliterated, a single line drawn through the change is sufficient. The clinical record should show that entries therein were made at or about the time the diagnostic procedures were accomplished. Failure to do so may cause the accuracy of the entire record to be questioned. It is important to preserve carefully the complete clinical record beyond the time during which malpractice action may be brought, which varies from 2 years under the Federal Tort Claims Act to as long as 20 years in some state courts. These precautions obviously impose added burdens on the physician and hospital administrator, but, it is imperative that they be followed by those of us in the field of Federal medicine today if we are to preserve a high standard of professional conduct and avoid costly and damaging lawsuits.

PROBLEMS OF THE FLIGHT SURGEON IN KOREA

FREDERICK S. SPIEGEL, *Major, USAF (MC)*

THE problems encountered by flight surgeons in Korea are not greatly different from those elsewhere but certain phases of both aviation medicine and military medicine assume greater importance in a combat theater. These problems are enumerated and their significance is discussed in this report.

The chief types of Air Force combat aircraft in Korea are fighters, fighter bombers, light bombers, night intruders, and reconnaissance aircraft for weather, day and night photographic, and tactical control missions. Each wing has a number of administrative aircraft and trainers; there are helicopters and light aircraft in the rescue squadrons. Problems arise and conditions exist in each wing which are peculiar to its mission and to the type of aircraft flown.

In Korea a pilot or crew member is "combat experienced" after he has completed a combat tour of duty. For fighter pilots and fighter bomber pilots this tour is 100 missions. The crews of light bombardment, night intruder, fighter bomber, and weather and night photographic reconnaissance aircraft fly 55 missions. These tours usually require 5 to 6 months to complete, whereas the assignment of the noncombat crew member is for 1 year. The number of hours flown depends upon such factors as the mission, type of aircraft, weather, time of day, and fuel and ordnance load, etc. Missions vary in duration from 40 or 50 minutes to 4 or 5 hours.

The morale of the flying personnel is closely allied with the number and types of its missions. The morale of the different organizations is directly related to the activity of the units. The busier they are, the higher the morale rises until it reaches a point where fatigue sets in, then it drops. Morale is dependent upon the number of operational aircraft, the casualty rate, the excellence of ground crew support and maintenance, and available recreational facilities. One of the best indications of the morale of a tactical squadron is the number of missions which are aborted. A secondary but fairly reliable index is the accident

From 67th Medical Group. Presented at the Far East Air Force Medical Seminar, Nagoya, Japan, 25 September 1952. Major Spiegel is now at Larson Air Force Base, Wash.

rate. One of the busiest men in a unit with good morale is the flying safety officer, but in a dispirited organization he is the aircraft accident investigating officer.

Housing facilities for aircrews generally are satisfactory in Korea. The chief types of billets are tents, quonset huts, and a few rehabilitated permanent buildings. During the summer these billets are hot and humid and it is difficult for night crews to receive adequate rest. In the winter they are heated by either space heaters or stoves which burn diesel fuel. The water at most Korean bases is not potable. Either boiled or chlorinated water from inspected trailers is used in canteens which are handled only by military personnel. A very strict control on chlorination is maintained, and the terminal residual chlorine must be at least 5 p. p. m.

Food is well prepared from quartermaster menus and with considerable ingenuity. Fresh meat and fresh vegetables or salad are available daily and fresh fruit is obtained frequently. Some wings have reported a fairly high incidence of gas pains at altitude, and a study has been undertaken to determine the feasibility of special or controlled diets for pilots who fly high-altitude missions.

Recreational facilities at some bases are very adequate, at others grossly inadequate. Where good facilities are available, the incidence of intoxication and venereal disease has decreased and there is less gambling and delinquency.

Hospitalization of most Air Force patients is accomplished in Air Force hospitals. Air evacuation of patients expected to be hospitalized in excess of 30 days is accomplished by the 801st Medical Air Evacuation Squadron, which also supplies the airlift for emergency cases. Helicopter evacuation of patients to and from our hospitals operates very smoothly. One hospital has its own heliport 50 yards from the emergency ward, and helicopters come in daily from outlying dispensaries and other hospitals. Consultation service from Headquarters, Far East Air Forces, is available at all hours, and it is not unusual to make such a request and have the consultant arrive the same day.

Sanitary facilities and sanitation in Korea generally leave a lot to be desired. Insanitary practices that have been followed for scores of generations of Koreans cannot be changed rapidly. It is necessary to throw up a protective barrier around our units. Tactical commanders are advised of the sanitary conditions of the base by the reports of rigid inspections of dining halls, kitchens, bakeries, ice cream plants, water sources, latrines, barber shops, clubs, and billets. Frequent and regular, periodic physical and laboratory examinations of food handlers are required, and no indigenous person is permitted in direct contact with any

edibles. Supervised bathing is practiced, laundered clothing is furnished, and daily physical inspections are performed by mess supervisors. Insect control is rigidly enforced. Buildings are regularly sprayed inside and out with residual sprays and aerosol bombs. All military personnel sleep under mosquito netting. Periodic area aerial spraying is done by C-46 type aircraft. All accumulations of water are drained immediately or covered with oil. Fire barrels (55 gallon) are treated with 1 cup of 5 percent DDT powder every 30 days. Every case of malaria in our units has been traced to faulty antimalaria discipline, i. e., irregular or sporadic chloroquine prophylaxis, haphazard use of insect repellent, disregard and disuse of mosquito bar at night, or improper clothing when on duty at night.

A flight surgeon regularly participates in the monthly flying safety meeting program, usually reviewing specific phases of physiology with direct relation to the problems, accidents, or incidents discussed. At these wing-wide meetings new equipment or procedures are introduced.

In aircraft accident investigations, the flight surgeon works closely with the flying safety officer, and his observations and judgment are respected by the accident board. He is also a member of the flying evaluation board and is asked to give expert professional advice concerning the psychologic and physiologic qualification or disqualification of the respondent. Each squadron flight surgeon is present on the flight line when an emergency arises involving any aircraft or pilot of his unit. There is an extremely close relationship built up between aircrews and the unit flight surgeon in the combat zone. Frequently pilots desire to inspect emergency medical facilities, and it is not uncommon to conduct several through the emergency wards or have them as interested spectators at helicopter evacuations or aircraft rescue practice procedures. Most wings have their own individually developed first-aid kits to be used by their own personnel under conditions peculiar only to their mission.

The majority of our pilots and navigators are Reserve officers who have been recalled to duty involuntarily. The average age of these officers is 31 or 32 years. They are more mature men, not the eager fly-boys they used to be. A few are bitter and resentful because they have been sent here. These officers are a distracting and a disturbing influence. They seek relief from flying duties by various methods, and develop bizarre complaints and excuses. The chief excuse is an "incapacitating fear of flying." This situation is difficult to evaluate, but it is decreasing, and has never been a major problem. If such a patient presents no demonstrable psychologic or psychiatric disease, he is handled as an administrative problem.

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SUMMARY

Not all of the problems of the flight surgeon in Korea are associated with flying, but as a doctor he is trained and indoctrinated in all phases of aviation and military medicine. His primary mission is to maintain the flying and fighting strength of his unit. He must diligently engage in practicing field medicine and surgery, sanitation and preventive medicine, accident prevention and flying safety promotion, aviation medicine and instruction in aviation physiology; he must monitor and assist in the personal equipment program, judge morale and assist his commander in maintaining it at a high level, supervise, and train personnel in all phases of medical service; in short, he is an advisor in many specialties.

RADIOLOGIC HEALTH TRAINING PROGRAM

A series of courses in radiologic health will be presented by the U. S. Public Health Service at the Environmental Health Center in Cincinnati, Ohio beginning on 5 October 1953 and continuing through 19 February 1954. These courses are designed to provide professional personnel working in health departments and other organizations with a working knowledge of the health hazards associated with radiation. Candidates should have a degree in medicine, engineering, or in one of the physical or biological sciences. Courses are two weeks in length and there is no tuition.

The correlation between obesity and serum lipoprotein levels coupled with this demonstration that weight reduction will often lower these serum lipoproteins suggests that in our present state of knowledge the prevention and correction of obesity is the most plausible treatment of atherosclerosis. This approach would be strengthened if a positive correlation between the serum lipids and the causation of atherosclerosis were established.

—WELDON J. WALKER, Lieutenant Colonel, MC, USA et al.
in *The American Journal of Medicine*

CLOSURE OF GRANULATING WOUNDS WITH ADHESIVE STRAPS

AUGUST W. SPITTLER, *Colonel, MC, USA*

JOSEPH W. BATCH, *Colonel, MC, USA*

THE conversion of an open wound to a closed wound to prevent reinfection and fibrosis of the underlying tissue has been a long-established principle of surgery. In the treatment of large and small granulating wounds, the surgical repair is usually performed either by excision of the granulating area, undermining the skin edges, and approximating the skin edges with sutures, or by closure with skin grafts, but there are many occasions when the patient cannot be treated surgically because of his general condition or because of other wounds.

Open wounds and defects, even over exposed bone, fill in with granulations which contract down and finally become covered with an immature epithelial covering resulting in a closed wound. The large granulating wound surfaces of an open or guillotine amputation can be made to close over by the application of constant skin traction. This principle to close a wound may be employed on the surfaces of extremities or other parts of the body surface by applying a horizontal pull on the skin with adhesive strips. For many years adhesive tape cut in the pattern of a "butterfly" has been used, but not extensively, to prevent wound dehiscence or to approximate and hold wound edges together when sutures failed to do so for some reason or have been removed prematurely. The use of adhesive tape as a definitive or primary method of closing granulating wounds was advocated and practiced by Keller for many years with amazing results even in the days before antibiotic therapy. With antibiotics to control infection and enzymes to reduce fibrosis, it occurred to us that the method deserved a retrial, particularly in those patients where previous surgical closure had failed because of tension.

In 1950, when a number of Korean casualties arrived at this hospital with multiple, clean, granulating wounds, and other wounds or injuries or a full operating schedule prevented surgical care immediately, the method was tried. It soon became apparent

From Walter Reed Army Hospital, Washington, D. C.

that it was a treatment of merit, and many wounds were completely healed before they could be scheduled for definitive surgery. In other instances to obtain a satisfactory closure the magnitude of the surgery was greatly reduced. Several hundred wounds have now been treated by this method with gratifying results and we believe that it has a definite place as a method of treatment. We continue to use it both as an interim as well as a definitive method of obtaining closure of granulating wounds in selected patients.

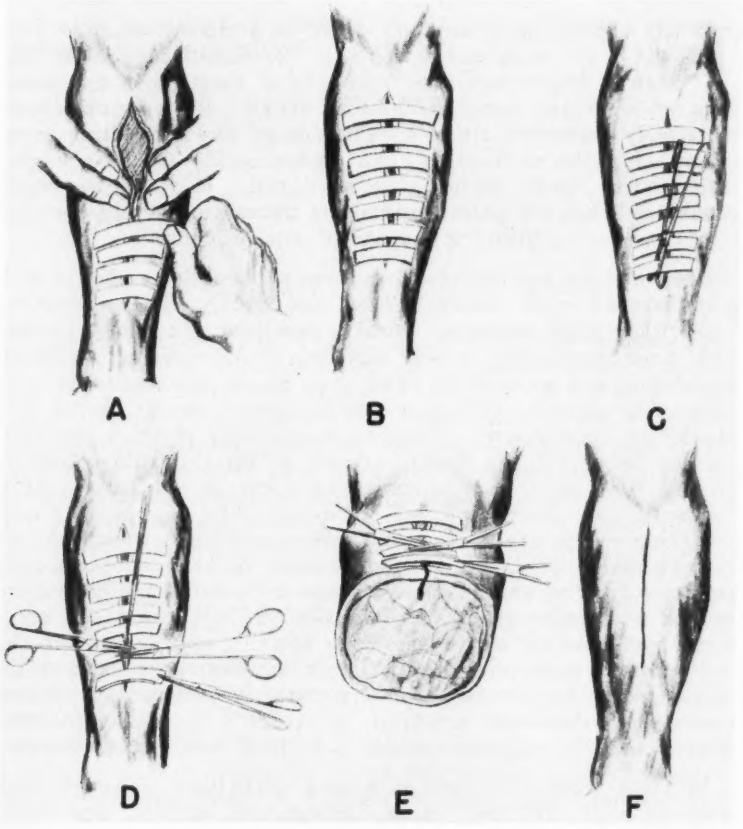

Figure 1. (A) The initial application of adhesive tape with approximation of skin edges. (B) Strips of adhesive tape in place. (C) Cutting of adhesive strips along wound margin. (D) Replacement of loose adhesive tape strapping with additional strapping. (E) Cross section of (D) revealing how wound edges are approximated by traction. (F) The healed wound.

TECHNIC

Thorough wound hygiene is first accomplished by cleansing agents such as hydrogen peroxide or detergent soaps. Necrotic debris is digested and removed by the application of crystalline trypsin every 3 hours for several days. Appropriate antibiotic therapy systemically or in conjunction with local antibiotic therapy is maintained.

The skin around the wound is painted with compound tincture of benzoin or other adhesive agent. The skin edges are drawn together and held by an assistant while strips of adhesive tape, varying in width from 1/4 to 1 inch, are placed on one side of the wound and across the wound, in the desired direction of pull, and firmly attached on the opposite side (fig. 1A). The adhesive strips are placed at 1/4-inch intervals along the entire length of the wound (fig. 1B). Care must be exercised not to completely encircle an extremity or the skin margin will not be pulled toward the center of the ulcer. Sterile dressings are applied over the taped wound.

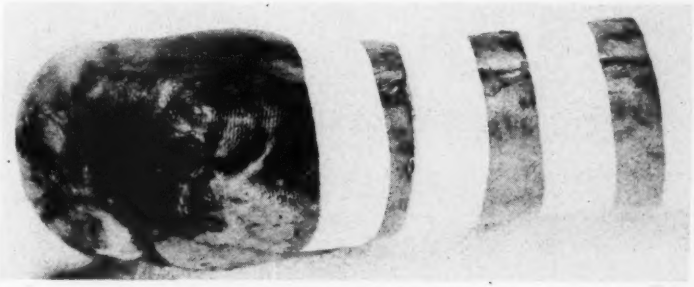

Figure 2. An amputation stump of the right leg during the course of adhesive tape strapping of a wound which initially was 2½ inches wide and 12 inches long with the shaft of the tibia exposed.

In 24 hours the skin will have relaxed, the adhesive across the ulcer loosened and the defect will be smaller. The adhesive must then be reapplied to maintain traction on the skin. The adhesive strips are not completely removed, but only that portion overlying the wound proper is cut out with sterile scissors without allowing the edges to retract even momentarily (fig. 1C). An assistant with two forceps grasps each cut end of the adhesive strip and maintains traction in the direction of pull while a new strip is placed over the old one across the wound or ulcer (figs. 1D and 1E). Each strip is replaced in turn in a similar manner. External dressings are changed as indicated for wound cleanliness or enzymatic treatment and adhesive strips are adjusted daily until wound healing takes place (fig. 1F).

DISCUSSION

Most wounds can be closed in from 2 to 6 weeks by this method. In many instances no further surgical correction need be performed on the resultant scar. Large wounds closed in this manner may require a scarplasty to convert a resultant adherent scar to a smooth, pliable surface. In large wounds of the extremity the resultant contouring effect of this closure is often better than when skin grafts are used (figs. 2 and 3). By employing this method of wound closure in selected patients, operating-room time will be conserved and patients will be given fewer anesthetics.

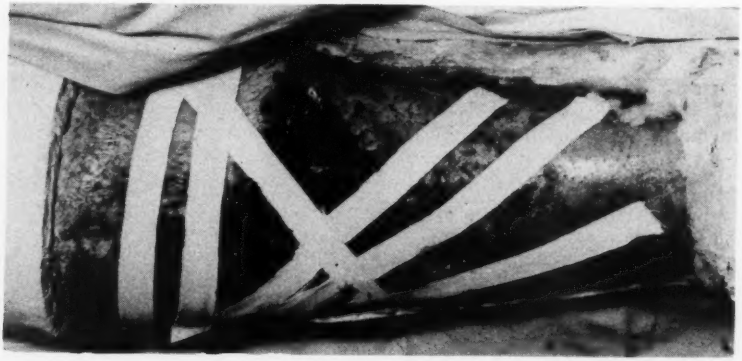

Figure 3. A large, irregular, broad, granulating wound of the anterior surface of the right leg which is being approximated with adhesive tape strapping in multiple planes.

CONCLUSIONS

Granulating wounds, even large ones, may be closed without surgical intervention by the use of adhesive tape to obtain skin traction in the desired direction. Many wounds heal with small scars which may not require other surgical correction. The magnitude of the surgical procedure is reduced in those still requiring an operation.

SCAPULA RETRACTOR

ROBERT M. HARDAWAY, III, *Lieutenant Colonel, MC, USA*

DONALD W. CLAYBORNE

WHEN a thoracotomy is performed through a rib higher than the seventh, it is necessary to retract the scapula upward to expose the rib to be resected. For instance, in pneumonectomy the fifth rib is commonly resected, requiring that the tip of the scapula be retracted upward from the seventh to the fourth rib. An intern can hold a retractor but it is a

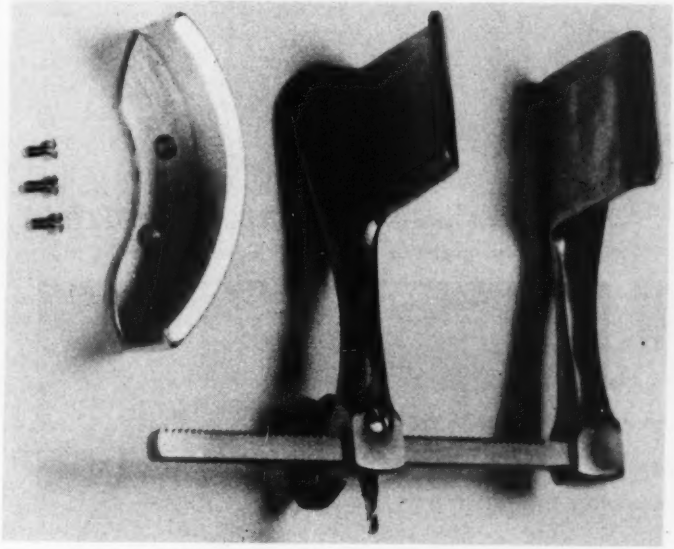

Figure 1. Rib retractor and scapula retractor attachment.

fatiguing assignment which immobilizes the assistant. The scapula may be retracted by having a blade on the self-retaining rib retractor sufficiently long to include both the scapula and the upper rib. The standard rib retractor (3-617-600 Retractor, common, rib, self-retaining, Tuffier) has two identical blades which are not long enough to hold the scapula. An attachment for this retractor was constructed by the Ordnance Section of The

From the U. S. Army Hospital, Fort Belvoir, Va.

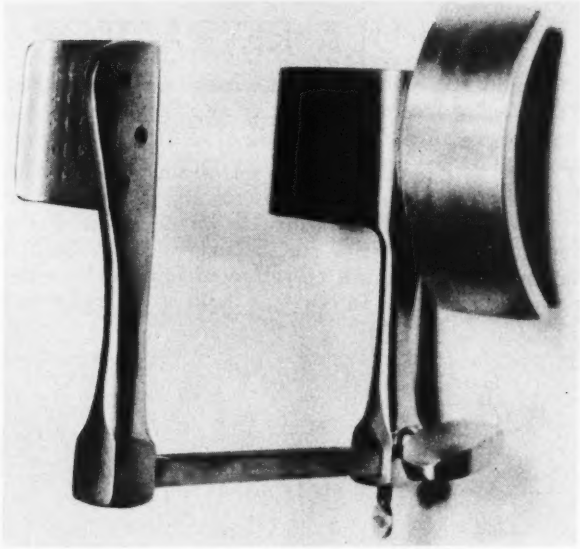

Figure 2. Rib retractor with scapula retractor attached.

Figure 3. Scapula retractor in use.

Engineer Center, Fort Belvoir, Va., from an aluminum piston of a diesel engine (figs. 1-3). This can be easily attached to the standard rib retractor when retraction of the scapula is necessary. For operations below the seventh rib it can be removed.

THROMBOANGIITIS OBLITERANS IN WOMEN

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THROMBOANGIITIS obliterans is rarely encountered in women. Only 60 instances have been reported *(3-25)*. The incidence of thromboangiitis obliterans in women may be higher than this indicates because many cases are probably not recognized as such. The diagnosis was proved by histologic study in 9 of the 60 women *(3-8)*. The clinical diagnosis was questioned in the others by Horton and Brown *(7)* and in 11 of these *(7, 10, 13, 16, 20-22)* by Silbert *(18)*. In the patient reported by Trabaud and Chaty *(21)*, recurrent jaundice; gangrene

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(3) Atlas, L. N.: Case of Buerger's disease in old woman. Am. Heart J. 26: 120-123, July 1943.
(4) Davis, H. A., and King, L. D.: Comparative study of thromboangiitis obliterans in white and Negro patients. Surg., Gynec. & Obst. 85: 597-603, Nov. 1947.
(5) Fisher, R. L.; Zukerman, M.; and Sweeny, D. N., Jr.: Thrombo-angiitis obliterans in women; report of a case. Angiology 2: 132-137, Apr. 1951.
(6) Frank, N.: Thromboangi-itis obliterans in women; review and report of a proved case. J. M. Soc. N. Jersey 49: 26-28, Jan. 1952.
(7) Horton, B. T., and Brown, G. E.: Thrombo-angiitis obliterans among women. Arch. Int. Med. 50: 884-907, Dec. 1932.
(8) Meleney, F. L., and Miller, G. G.: Thromboangiitis obliterans. Ann. Surg. 81: 976-993, May 1925.
(9) Buerger, L.: The Circulatory Disturbances of the Extremities. W. B. Saunders Co., Philadelphia, Pa., 1924.
(10) Dürck, H.: Die sogenannte "Thromboangiitis obliterans" im Rahmen der infektiös-toxischen Gefässentzündungen. Verhandl. d. deutsch. path. Gesellsch. 25: 272-291, 1930.
(11) Hammarstrom, E.: Thrombo-angiitis obliterans (Buerger's disease); gangrene of extremities and of loop of small intestine and portal thrombosis in woman. Svenska läk.-tidning. 36: 1565-1572, Aug. 25, 1939.
(12) Herrell, W. E., and Allen, E. V.: Thrombo-angiitis obliterans in women; report of a case. Am. Heart J. 12: 105-108, July 1936.
(13) Koyano, K.: Thrombo-angiitis obliterans. Acta scholae med. univ. imp. Kioto 4: 489-510, Apr. 1922 (in English).
(14) LeFevre, F. A., and Burns, J.: Thromboangiitis obliterans in women; report of two cases. Cleveland Clin. Quart. 11: 49-52, Apr. 1944.
(15) Millman, S.: Thromboangiitis obliterans in woman; report of case. Am. Heart J. 15: 746-748, June 1938.

of digits, ear, nose, sacrum, heels, trochanters, and elbows; and terminal coma are somewhat suggestive of thrombotic thrombocytopenic purpura *(26-30)*, although an exact diagnosis is not possible from the data given. Early conclusions regarding the limitation of thromboangiitis obliterans to young Jewish men have been modified by reports of its occurrence in the aged *(3-7)*, in women *(3-25)*, and in Negroes *(4, 31, 32)*. Criteria for the diagnosis of thromboangiitis obliterans in the absence of histologic evidence were outlined by Allen et al. *(33)* and others as follows: (1) the presence of occlusive vascular disease, (2) onset before the age of 40 years, (3) the presence of or adequate history of superficial thrombophlebitis, (4) involvement of both upper and lower extremities, and (5) the absence of lipemia and diabetes mellitus. Although not all proved instances of the disease meet these criteria, they are of aid in clinically establishing the diagnosis.

(16) Robinson, S. K.: Thromboangiitis obliterans in woman with menopausal syndrome. M. Rec. 149: 223-224, Apr. 5, 1939.

(17) Seidenstein, H.: Unusual peripheral vascular disease in woman (thrombo-angiitis obliterans?). Bull. Hosp. Joint Dis. 3: 73-75, Apr. 1942.

(18) Silbert, S.: Thrombo-angiitis obliterans in women; report of 2 cases. Ann. Surg. 101: 324-328, Jan. 1935.

(19) Silbert, S.: Further experiences with thromboangiitis obliterans in women. Am. Heart J. 36: 757-771, Nov. 1948.

(20) Telford, E. D., and Stopford, J. S. B.: Two cases of thrombo-angiitis obliterans in women. Brit. M. J. 1: 1140-1141, June 25, 1927.

(21) Trabaud, J., and Chaty, C.: Étude microscopique des lésions dans un cas de maladie de Léo Buerger chez une femme musulmane. Bull. et mém. Soc. méd. d. hôp. de Paris 47: 583-584, Apr. 6, 1931.

(22) Trabaud, J., and Mredden: Maladie de Léo Buerger chez une fille musulmane. Bull. et mém. Soc. méd. d. hôp. de Paris 47: 579-583, Apr. 6, 1931.

(23) Van Dellen, T. R., and Wright, I. S.: Thromboangiitis obliterans in women; report of case. Am. Heart J. 13: 373-375, Mar. 1937.

(24) Wilensky, N. D., and Collens, W. S.: Thrombo-angiitis obliterans in sisters. J. A. M. A. 110: 1746-1747, May 21, 1938.

(25) Williams, W. S., and Barker, N. W.: Thrombo-angiitis obliterans among women; report of 2 cases. Proc. Staff Meet., Mayo Clin. 21: 55-58, Feb. 6, 1946.

(26) Moschcowitz, E.: Acute febrile pleiochromic anemia with hyalin thrombosis of terminal arterioles and capillaries. Arch. Int. Med. 36: 89-93, July 1925.

(27) Singer, K.; Motulsky, A. G.; and Shanberge, J. N.: Thrombotic thrombocytopenic purpura; studies on hemolytic syndrome in this disease. Blood 5: 434-448, May 1950.

(28) Beigelman, P. M.: Variants of platelet thrombosis syndrome and their relationship to disseminated lupus. Arch. Path. 51: 213-223, Feb. 1951.

(29) Meacham, G. C.; Orbison, J. L.; Heinle, R. W.; Steele, H. J.; and Schaefer, J. A.: Thrombotic thrombocytopenic purpura, a disseminated disease of arterioles. Blood 6: 706-719, Aug. 1951.

(30) Meacham, G. C.; Orbison, J. L.; and Heinle, R. W.: Thrombotic thrombocytopenic purpura; observations on its course and pathogenesis. J. Lab. & Clin. Med. 36: 964-965, Dec. 1950.

(31) Warshawsky, H.: Thrombo-angiitis obliterans in Negro; report of case. M. Bull. Vet. Admin. 18: 83-85, July 1941.

(32) Yater, W. M.: Thromboangiitis obliterans in Negroes; report of 5 cases studied arteriographically and pathologically. Am. Heart J. 13: 511-533, May 1937.

(33) Allen, E. V.; Barker, N. W.; and Hines, E. A., Jr.: Peripheral Vascular Diseases. W. B. Saunders Co., Philadelphia, Pa., 1946.

Recently, in this clinic, a woman was observed to have organic involvement of the peripheral vessels of her upper and lower extremities for which several of the newer vasodilating agents were given. The findings satisfied the clinical criteria for the diagnosis of thromboangiitis obliterans.

CASE REPORT

A 33-year-old white woman, a heavy smoker, of Dutch-English extraction, developed thrombophlebitis of her right foot in 1944 which subsided after 3 weeks of conservative therapy. Following minor trauma, recurrences of thrombophlebitis occurred in her right leg in 1946 and in her left leg in 1948. In October 1949, a tennis ball struck the tip of her left middle finger. A paronychia developed, resulted in partial loss of the digital pad, and required 3 months to heal. In February 1950, following a long, cold automobile ride, the patient developed severe burning pain, numbness, swelling, tenderness, and mottling of the toes of her left foot. These symptoms subsided partially but later returned and grew worse. In addition, after walking 1 or 2 blocks at a moderate pace, she noticed pain in her left calf and foot. The toes of her left foot became cyanotic and on the appearance of ulceration of the toes, she sought medical aid and was admitted to this hospital in May.

TABLE 1. *Skin temperature and oscillometric readings*

	Right foot	Right ankle	Left foot	Left ankle
Average skin temperature (°C.) of toes and plantar surface	29.9		28.7	
Oscillometric readings	0.25	1	0	0.38

She had smoked 2 packs of cigarettes daily for 13 years. Her alcohol intake was moderate. There was no history of previous illness or the use of drugs. A grandmother died of heart disease manifested by angina pectoris. There was no other history of vascular disease in the family.

The toes of the left foot were cooler to touch than those of the right foot. There was redness, swelling, and marked tenderness in the first 3 toes of the left foot with blackened ulceration on the medial surface of the distal phalanx of the first toe. A yellow-brown crusting exudate oozed from beneath the nails of the second and third toes. The popliteal and posterior tibial pulses were present in the right leg but were absent in the left. The radial, brachial, and femoral pulses were normal. The ulnar pulses were absent and the Allen test *(33)*, which was positive bilaterally, indicated decreased ulnar arterial flow. Elevation of

the lower extremities produced marked blanching and dependency produced rubor of the feet which was more pronounced in the left foot. Skin temperature and oscillometric studies at a room temperature (28° C.) are shown in table 1. Following standard exercise (40 ascents over two 9-inch steps), the oscillometric readings of the right ankle increased from 1.5 to 1.75, a normal response; on the left, it decreased from 0.5 to a trace, which is considered by Prandoni et al. *(34)* to be suggestive of organic vascular disease. An exercise tolerance test of the upper extremities (50 flexions of the hands) produced oscillometric changes of the right wrist from 1.25 to 1.5 and of the left wrist, from 1 to 1.5, normal responses. A left lumbar sympathetic block by procaine injection produced an increased skin temperature of the left calf and ankle, but none in the foot.

TABLE 2. *Skin temperature and oscillometric readings*

	Right	Left
Average skin temperature (°C.) of first, third, and fifth		
Toes	29.9	25.5
Fingers	31.1	
Oscillometric readings:		
Foot	0.25	0
Ankle	1	0

The patient was instructed to stop smoking. Fifty milligrams of benzazoline (priscoline) was injected into her left femoral artery once or twice daily, and 200 mg. was given daily by mouth. The intra-arterial injection of benzazoline occasionally resulted in an exacerbation of pain in the toes which lasted about 2 hours and was accompanied by increased warmth of the foot. Whisky, sedation, whirlpool baths, bland soaks, and antibiotics were also used.

This regimen of therapy was accompanied by moderate subjective relief with some improvement in the appearance of the toes. After 4 or 5 weeks, several of the toenails were removed. The patient was given 60 mg. of phentolamine 3 times daily, with an equivocal response, and 10 mg. of hydralazine hydrochloride by intramuscular injection, twice daily. Occasional headache accompanied the latter medication, but definite skin temperature rise followed each dose. The cyanosis of the left toes decreased but evidence of chronic infection persisted and

(34) Prandoni, A.; Orbison, J. A.; and Moser, M.: Personal observations.

TABLE 3. *Exercise tolerance test**

	Oscillometric readings		
	Before	Immediately after	Three minutes after
Ankle, right	2.5	4	3
Ankle, left	1.5	0.5	1.5
Foot, right	1		
Foot, left	trace		

*40 steps (equal to double the standard Master's test).

after 3 months spontaneous drainage occurred from the left third toe. A culture revealed the presence of penicillin-sensitive *Micrococcus pyogenes* var. *albus*. After appropriate antibiotic therapy, progressive ambulation was well tolerated. The patient was discharged from the hospital and given maintenance doses of benzazoline, hydralazine hydrochloride, and aureomycin. A week later she developed abdominal pain, icterus, clay-colored stools, and dark-brown urine. She was readmitted to the hospital with a diagnosis of acute hepatitis confirmed by needle biopsy of the liver. Her illness was complicated by a right pyelonephritis, severe ascites, and hepatic coma. By January 1951, she showed definite improvement. During sick leave in April, she had an episode of coldness, pain, and blanching of her left foot while flying at a high altitude. Examination several weeks later revealed deformity of her left third toenail, blanching on elevation

TABLE 4. *Cold room skin temperature study*

	Room temperature		
	28.2° C.	15.6° C.	27.6° C.
Right foot*	33.5	18.5	25.5
Right hand*	34.1	20.7	31.6
Left foot*	30.7	18.8	25.2
Left hand*	33.1	24.6	31.7

*Average temperature (°C.) of first, third, and fifth digits.

of her feet, and a rubor on dependency which was more pronounced in her left foot. Walking more than 5 blocks at a moderate pace resulted in pain and tenderness in the proximal portion of her left foot and some soreness in her calf.

She was released from the hospital in June and advised to live in a warm climate. In the ensuing 6 months she continued to smoke cigarettes and intermittent claudication persisted in spite of light activity. In January 1952 her fingers and toes were warm to the touch and no rubor or blanching of her hands or feet was present. Her skin temperature and oscillometric readings

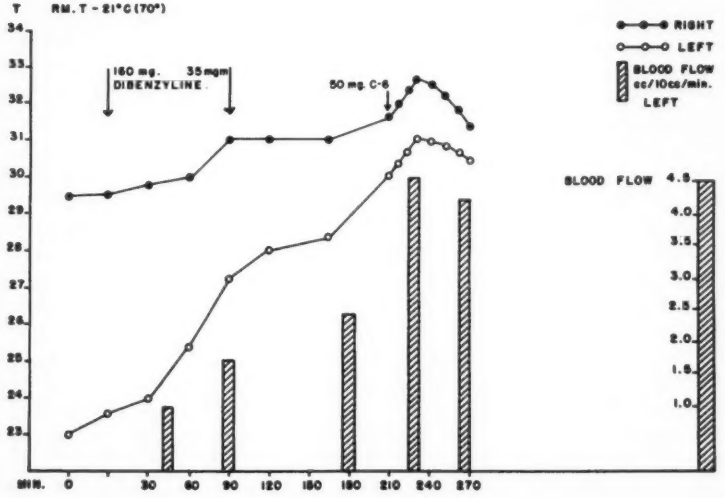

Figure 1. Skin temperature and blood flow response to dibenzyline by mouth and hexamethonium bromide intravenously.

at that time are shown in table 2. Venous filling time was only slightly delayed. There was no ulceration or edema. Electronic oscillometric studies *(35)* revealed slightly decreased resting pulsations of the right lower extremity and definitely decreased pulsations on the left. An exercise tolerance test revealed a normal response on the right and an abnormal response on the left (table 3). A slightly increased vasoconstrictor response to cold in the lower extremities followed a 20-minute exposure to a temperature of 15° C. (table 4). Blood flow studies (fig. 1), using the venous occlusion plethysmograph *(36)* and the vasodilating agents, dibenzyline *(37)* and hexamethonium bromide *(38)*, re-

(35) Kasner, E., and Hersh, J. B.: Electronic oscillometer. Angiology 1: 391-395, Oct. 1950.

(36) Burch, G. E.: New sensitive portable plethysmograph. Am. Heart J. 33: 48-75, Jan. 1947.

(37) Moser, M.; Watkins, D.; Morris, N.; and Mattingly, T. W.: Effect of dibenzyline on skin temperature, peripheral blood flow, and vasomotor responses in normal patients and patients with increased vasoconstrictor tone. Unpublished data.

(38) Johnson, R. I.; Freis, E. D.; and Schnaper, H. W.: Hemodynamic changes in small vessels in man as analyzed by digital plethysmography. Angiology 2: 412-422, Oct. 1951.

vealed an increase in skin temperature and blood flow response on the right lower extremity which closely paralleled responses observed in normal persons. On the left, however, the maximum skin temperature was 30.5° C. and the blood flow response was only two-thirds of that observed in normal patients in this laboratory, indicating the inability to achieve maximal vasodilatation, that is, the presence of organic occlusive vascular disease.

Two biopsies in the region of the left gastrocnemius muscle failed to reveal evidence of vascular disease. The patient's clinical status rendered biopsy of her posterior tibial artery inadvisable. Several attacks of superficial thrombophlebitis were observed in the course of her hospitalization. A right nephrectomy was performed to remove the chronically infected kidney and pathologic sections of it did not show any vascular disease. The oral administration of dibenzyline was accompanied by some increase in the temperature of the left foot and a decrease in sweating, but intermittent claudication continued. The persistence of symptoms and failure of the patient to stop smoking necessitated her separation from the military service.

DISCUSSION

This patient's clinical signs and symptoms, together with extensive investigation of blood flow response to the administration of various vasodilating agents, established the existence of organic vascular disease. In addition, abnormal vasoconstrictor activity was demonstrated. The patient presented classical signs and symptoms of thromboangiitis obliterans including recurrent migrating thrombophlebitis without apparent cause, clinical evidence of upper and lower extremity involvement, and absence of evidence of arteriosclerosis. Despite 2 negative biopsies, a clinical diagnosis of thromboangiitis obliterans appears to be valid in this instance.

Why this disease tends to occur predominantly in men has not been established. The role of sensitivity to tobacco in the pathogenesis of the disease has been discussed *(9, 39-41)*. Silbert *(19)* reported an increase in the incidence of thromboangiitis obliterans in women from 1 percent in his first 1,000 to 4 percent in his next 600 cases. He ascribed this to the increased consumption of tobacco by women. The patient presented here was a heavy smoker, and the continued progression of her disease was considered to be related to her inability to refrain from smoking.

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(39) Meyer, W.: Etiology of thromboangiitis obliterans (Buerger). J. A. M. A. 71: 1268-1272, Oct. 19, 1918.

(40) Barker, N. W.: Tobacco factor in thrombo-angiitis obliterans. Proc. Staff Meet., Mayo Clin. 6: 65-68, Feb. 4, 1931.

(41) Silbert, S.: Etiology of thromboangiitis obliterans. J. A. M. A. 129: 5-7, Sept. 1, 1945.

The withdrawal of tobacco is important in the treatment of thromboangiitis obliterans. Mild cases often respond to cessation of smoking alone. Others require a full therapeutic regimen, including exercises, reflex vasodilatation by the distal application of heat, vasodilating agents (oral, intravenous, intra-arterial), the rocking bed, intermittent venous occlusion apparatus, and sympathectomy. Therapy is directed toward the release of vasoconstrictor tone, but the benefit to be derived from this release is limited by the amount of unyielding organic occlusion already present. Thus, sympathectomy has not proved of significant value in the patients studied at this clinic, except for those characterized by a severe degree of vasoconstrictor tone and minimal organic involvement. In patients selected for sympathectomy, partial relief of pain has resulted. The patient presented here had a high degree of vasoconstrictor tone with organic vascular involvement of moderate severity, especially in the left leg. Although hexamethonium bromide and dibenzyline effected release of vascular tone, maximal blood flow was not obtained and intermittent claudication persisted.

SUMMARY

Thromboangiitis obliterans in women is a clinical rarity. Of 60 instances reported in the literature, only 9 have been proved by histologic study. The diagnosis, based on clinical findings, appears warranted in 40 additional cases.

A woman was found to have organic vascular disease which met the established criteria for the clinical diagnosis of thromboangiitis obliterans. Evaluation of this patient's condition by the use of several of the newer vasodilating agents indicated the presence of a high degree of vasoconstrictor tone and a moderate degree of organic involvement. Intolerance to tobacco and inability to refrain from smoking were considered important in the development and progression of her disease. An increasing number of women with thromboangiitis obliterans may be encountered in the future because so many women are now smokers.

Therapy for this patient was directed toward cessation of smoking and release of increased vasoconstrictor tone. Although effective release of vasoconstrictor tone was accomplished by various means, the unyielding organic occlusion already present, together with continued smoking, prevented a satisfactory result.

RADIOLOGIC CLEARING IN SUBACUTE MASTOIDITIS TREATED WITH ANTIBIOTICS[1]

EMANUEL J. SOBIESKI, *M. D.*

ROBERT E. WAUD, *Captain, MC, USA*

IN our survey of the literature we found that most articles on the radiologic findings in mastoiditis were concerned with diagnosis and prognosis. Radiologic evidence of healing or healed mastoiditis is seldom mentioned in the literature probably because roentgenograms were obtained only as a preliminary requirement to surgical intervention in acute or chronic mastoiditis.

Of healed mastoiditis Graham-Hodgson *(2)* stated, "If the infection has been of sufficient severity and duration, the radiogram will show abnormal density of the middle ear on the affected side. The ossicles may or may not be visible, and the bony walls of the middle ear, the petrous bone and the mastoid process, will show a varying degree of sclerosing osteoitis. If the process is cellular, some or all of the cells may be completely obliterated by sclerosis of the walls, and the visible cells may be cloudy, due to granulations and chronic hyperplasia of the mucosa. Where a superimposed acute infection occurs in such a mastoid, it is frequently impossible to detect it radiologically."

The majority of the articles on mastoiditis belong to the era before the introduction of antibiotics when the treatment of chronic or subacute otitis or, better, otomastoiditis was essentially local, consisting of irrigation of the accessible cavity with sterile saline or antiseptic solutions, or placing hydrogen peroxide or a saturated alcoholic solution of boric acid or other antiseptic solutions in the external auditory canal. The pus was drained slowly through the antrum and tympanic membrane. If a cholesteatoma did not form, healing was produced by slow sclerosis of the mastoid. Mayer *(3)* stated that the increased denseness is a characteristic sign of repair.

(1) U. S. Army Hospital, Camp Stoneman, Calif.

(2) Graham-Hodgson, H.: Radiology of infected temporal bone. Proc. Roy. Soc. Med. 43: 989-998, Dec. 1950.

(3) Mayer, E. G.: Otologische Röntgendiagnostik (Band II). Holzknecht, G. (editor): Handbuch der theoretischen und klinischen (allgemeinen und speziellen) Röntgenkunde. Julius Springer, Berlin, 1930.

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The diagnosis of recovery was based on the purulent discharge stopping, the nonrecurrence of removed polyps, and closure of the perforation in the eardrum (not very common). The antibiotics presented the possibility of a systemic attack on the bacteria, not only of acute but also of subacute and chronic otomastoiditis.

We have observed 2 patients with subacute mastoiditis, treated with antibiotics, who showed healing, not only clinically but also radiologically. The diagnosis of subacute mastoiditis was made because neither patient gave a history of earache in childhood and the pneumatization of the mastoid bone was of the large cell type. The diagnosis of acute mastoiditis could not be made even though one patient developed slight pain and tenderness over the mastoid region and the other patient had no pain, fever, or leukocytosis and the only clinical findings were those of a purulent discharge and a large marginal perforation of the tympanic membrane.

CASE REPORTS

Case 1. A 23-year-old man was first seen in the E. N. T. clinic on 18 August 1952. He had had no previous attacks of otitis media. In April, while at another station, he was kicked in the right ear. A severe earache developed which was relieved on the second day when a discharge began from the ear. He reported to the dispensary and was treated with penicillin and an assortment of pills. He was ordered to this station in July. The discharge from his ear continued but pain was intermittent. On examination he had a seropurulent discharge from the right ear and a perforation of the tympanic membrane at its posterior margin. His hearing for low conversational voice on the right was 2/15; left, 15/15; for whispered voice on the right was 0/15; left, 15/15.

A diagnosis of chronic suppurative otitis media was made and he was given 250 mg. of terramycin in capsules 3 times a day, 600,000 units of penicillin intramuscularly daily for 5 days, alcohol and boric acid drops in the ear, and phenylephrine hydrochloride nose drops.

On 25 August he was seen by one of us (E.S.J.). At that time he complained of pain in the right ear. Examination revealed a mucous discharge. No perforation could be seen. The walls of the auditory canal were swollen and a furuncle of the canal was noted. Penicillin ointment for the ear was prescribed. On 29 August the furuncle was much improved. No discharge was present but soreness around the ear and tenderness of the entire mastoid area were present, especially at the apex. He was again given 600,000 units of penicillin daily. His leukocyte count was 9,300 with a normal differential count. The roentgenogram of the

mastoids revealed the left mastoid to be of the mixed cell type and to appear normal. The right mastoid was of the mixed cell type and showed moderate uniform clouding (fig. 1). A diagnosis of acute mastoiditis was made. Pain and tenderness of the mastoid region continued and the patient was admitted to the hospital on 11 September.

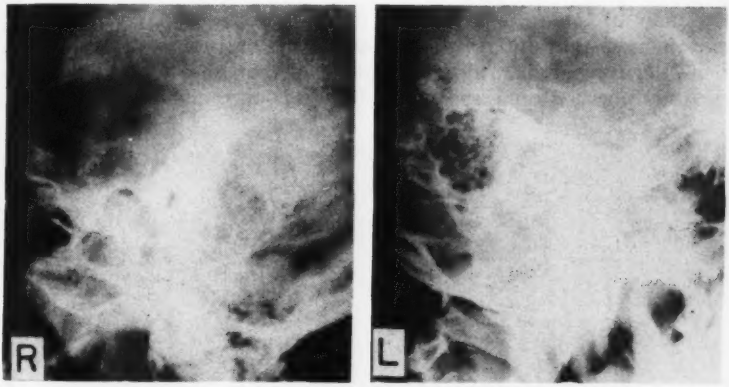

Figure 1 (case 1, 29 August 1952). The left mastoid (L) *is normal. The right mastoid* (R) *shows uniform clouding consistent with an acute or subacute mastoiditis.*

Because penicillin and terramycin had been prescribed prior to the patient's coming under our care and a favorable response had been obtained, and because no bacteriologic study had been made before this therapy was instituted, it was considered best to continue with it. The pain was relieved but the tenderness of the entire mastoid area persisted. On 16 September whispered voice was heard on the right. The tympanic membrane was in normal position. The leukocyte count was 7,100 with a normal differential count. Roentgenograms showed a decrease in the clouding of the right mastoid.

On 19 September the patient complained of dizziness. Despite the fact that vestibular phenomena have not been reported with terramycin, it was discontinued. Tests for vestibular damage, including the Bárány test, were negative for both sides. On 23 September the patient had had no recurrence of dizziness. Terramycin was again given. By 29 September there was no tenderness of the mastoid region. There had been no further dizziness. Roentgenograms showed slight residual clouding of the right mastoid region (fig. 2).

On 1 October whispered voice was 15/15 in both ears, the audiogram was normal in both ears, and the patient was discharged to full duty.

Comment. In spite of closing of the perforation in the tympanic membrane, the infection continued and developed in the mastoid bone. This possibility was pointed out by Diamant and Lilja *(4)* who stated, "* * * in a number of cases it seems that any infection can remain and progress in the cell system, despite the fact that the middle ear and the tympanic membrane show completely normal conditions." This patient's progress could be followed by decrease of pain, improved hearing, decreased leukocyte count, and changes on the roentgenograms. Apparently antibiotic therapy in high dosage brought about healing in the type of case in which previously a mastoidectomy would have been required.

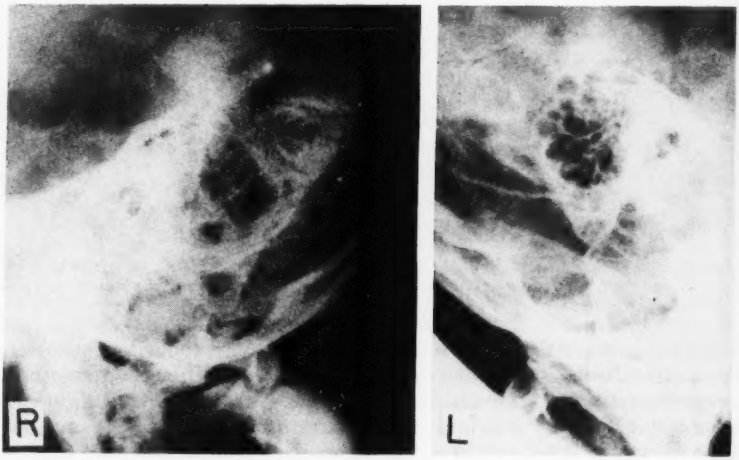

Figure 2 (case 1, 29 September 1952). Compared with previous roentgenograms and with the left side, the right mastoid reveals but slight residual clouding.

Case 2. A 33-year-old soldier was first seen in the E. N. T. clinic on 22 October 1952. He had had a left acute otitis media in 1944. In July 1952 a purulent discharge from the left ear began. It stopped spontaneously during August but began again in September and continued.

On examination there was a purulent discharge from the left ear. The tympanic membrane was destroyed posteroinferiorly and the remaining part was adherent to the promontory. The whispered voice hearing was 5/15 on the left. Culture of the aural discharge was made to determine the type of organism present as well as its antibiotic sensitivity. Only local treatment with sodium borate and hydrogen peroxide was given while awaiting the results of the laboratory tests.

(4) Diamant, M., and Lilja, B.: Chronic mastoiditis and its roentgen picture. Acta radiol. 29: 37-56, 1948.

On 27 October the ear was still discharging. The culture contained streptococci and staphylococci which were sensitive only to streptomycin. The leukocyte count was 3,900 and the differential count was normal. Roentgenograms taken on 22 October revealed the right mastoid to be normal but the left mastoid appeared to be sclerosed except for the tip where several small aerated cells were seen (fig. 3).

The patient was admitted to the hospital and 1 gram of streptomycin was given intramuscularly daily in divided doses. On 31 October the discharge was more liquid and mucopurulent. On 3

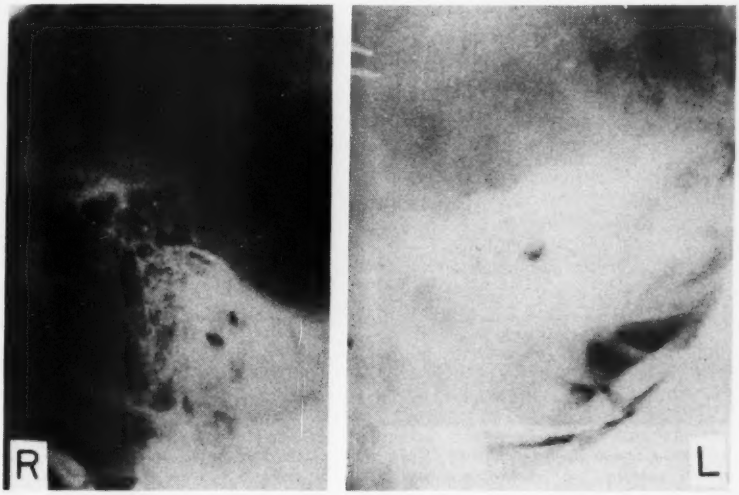

Figure 3 (case 2, 22 October 1952). The right mastoid is normal. The left mastoid appears sclerosed.

November the discharge was very slight. The leukocyte count was 4,900 with 54 percent neutrophils, 44 percent lymphocytes, 1 percent monocytes, and 1 percent basophils.

Roentgenograms still showed dense clouding of the left mastoid but some peripheral cells were visible. Local treatment was started on 12 November. The attic of the auditory canal was irrigated with sterile saline solution and some clots of purulent material were obtained. The patient was then placed in the right lateral position and the left ear filled with a 10 percent solution of streptomycin. Using a bulb syrine, negative then positive pressure was applied, as described by Reid (5) and by

(5) Reid, W. O.: Treatment of otorrhoea by argyrol displacement. Brit. M. J. 2: 1271-1272, Dec. 30, 1939.

one of us *(6)*. During this procedure the patient noted a "strange taste" in his mouth. The treatment was repeated on 13 November, and the irrigation returned clear.

On 14 November, local irrigations and streptomycin were discontinued. A total of 17 grams of streptomycin had been given. On 25 November the leukocyte count was 7,000 with a normal differential count. On 27 November the perforation of the drum was closed and the tympanic membrane moved normally. On 1 December the hearing on both sides was 15/15. Roentgenograms showed slight residual clouding of the left mastoid (fig. 4). The patient was discharged to full duty.

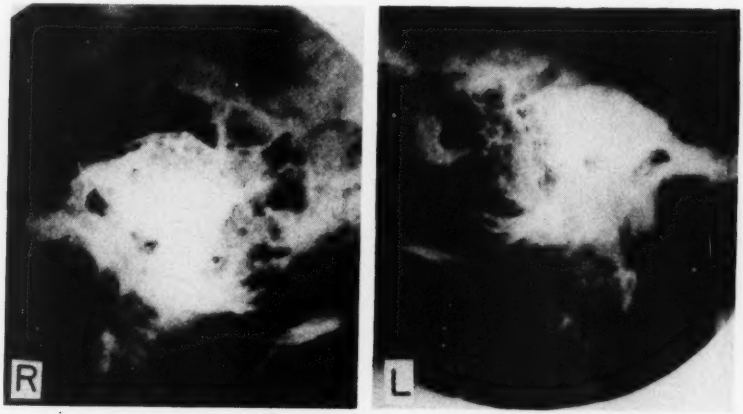

Figure 4 (case 2, 1 December 1952). Again the right mastoid is negative. The left mastoid shows reappearance of cells and only slight residual clouding. (There is a difference in position from the other roentgenograms but these were used because they were found to reproduce best.)

Comment. In this patient, as in the first, there was not only clinical healing but apparently complete recovery as demonstrated by the roentgenograms.

DISCUSSION

We cannot hope to draw definite conclusions from the 2 cases reported here. Other patients treated here gave indication of a similar response but, because of their transfers, follow-ups were incomplete. Mayer *(3)* mentioned the "restitutio ad integrum, in acute cases," or of "increasing denseness (in chronic ones), this strong shadowing being a characteristic sign of the process of repair." Bourgeois *(7)* stated that "only in acute mastoiditis is

(6) Sobieski, E. J., and Boulgakov, N. A.: Un cas d'otite chronique suppuree, A Proteus et Para-coli, gueri par le bacteriophage anti-ozeneux. Ann. oto-laryng. 69: 65-66, Jan. 1, 1952.

(7) Bourgeois, H.: Mastoïdite sereuse; etude anatomique et radiographique. (Sommaire. Societie de Laryngologie des Hopitaux de Paris, Seance du 21 janvier 1929). Ann. d. mal. de l'oreille, du larynx 48: 469-471, 1929.

clouding due to thickening of the mucous membrane." In some patients, edema of the mucosa causes such an increased density that the cell walls have disappeared entirely on the roentgenograms and reappeared as soon as the edema had regressed.

Moulonguet *(8)* and Lemaître *(9)* believed that clouding is from the decreased calcium content of the bone, due to inflammatory congestion in the mucosa and that it does not necessarily imply, therefore, that the bone is involved. Engström et al. *(10)* stated that the inflammatory process in the mucosa causes the pH to shift toward the acid side, resulting in a reduction of the calcium content in the air cell septums. In chronic mastoiditis the formation of the osteitic changes with osseous accretions on the cell walls has been discussed by Diamant and Lilja *(4)*, Mayer *(3)*, Mittermaier *(11)*, and Engström et al. *(10)*. Cashion *(12)* stated that, both with and without sulfonamide therapy, there are varying degrees of osteitic thickening. Mayer and Mittermaier believed that osteitic change appears only when there is complete focal destruction of bone by an infectious process and, after healing, mildly decalcified zones would be seen with their previous configuration.

Diamant and Lilja believed that destruction is not necessary before this change takes place. They demonstrated osteoid formation histologically within 1 month and new bone formation roentgenologically within 3 months after the discharge from the ear began.

In untreated chronic mastoiditis whatever the mechanism may be, the inflammatory process can be stopped with antibiotics even in the most deeply situated mastoid cells and the calcium content of the walls of the air cells can be returned to normal, as demonstrated by the roentgenogram.

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(8) Moulonguet, A.: Discussion in footnote reference *(7)*.

(9) Lemaître, F.: Discussion in footnote reference *(7)*.

(10) Engström, A.; Hamberger, C. A.; and Welin, S.: Röntgen-ray microspectrographic investigation of inflammatory destruction of mastoid bone. Brit. J. Radiol. 22: 309-324, June 1949.

(11) Mittermaier, R.: Röntgenologischer Beitrag zur Frage der Knochenneubildung bei Mastoiditis. Ztschr. f. Hals-, Nasen-u. Ohrenh. 45: 214-227, 1939.

(12) Cashion, W. R.: Symposium; changes which have resulted from use of sulfa drug therapy in x-ray findings in mastoiditis. New York State J. Med. 45: 493, Mar. 1, 1945.

Postgraduate Courses Conducted by Army Medical Service

The Army Medical Service will conduct a series of postgraduate courses during the fiscal year 1953-1954 for qualified medical officers of the Armed Forces and other physicians. The courses are: Clinical Laboratory Course, 15-19 March 1954 at Brooke Army Medical Center; Symposium on Pulmonary Diseases, 21-25 September 1953, and Clinical Electrocardiography and Recent Advances in Cardiovascular Diseases, 9-14 November 1953, Fitzsimons Army Hospital; Rehabilitation Techniques in Neuromuscular Diseases and Disabilities, 5-10 April 1954, Letterman Army Hospital; Forensic Pathology, 2-6 November 1953, and Pathology of the Oral Regions, 8-12 March 1954, Armed Forces Institute of Pathology; Seminar in Urology, 7-9 September 1953, Symposium on Circulation and Homeostasis, 5-9 October 1953, Symposium on Physical and Mental Health Standards, 16-17 April 1954, and Recent Advances in Medicine and Surgery including Psychosomatic Aspects of Medicine and Surgery, 19-30 April 1954, all at Walter Reed Army Medical Center.

Physicians who are certified by a specialty board or qualified for certification, chiefs or assistant chiefs of services at hospitals and officers well advanced in the study of their speciality are eligible to attend any of the courses. Officers partially qualified in a speciality, or with a special interest in it, are eligible to attend the courses at Brooke Army Medical Center, Fitzsimons Army Hospital, the Armed Forces Institute of Pathology, and the Symposium on Circulation and Homeostasis at Walter Reed Army Medical Center.

Applications for admission to any course must be submitted at least six weeks prior to the opening date. Medical officers on active duty and full-time Civil Service physicians should forward their applications through military channels to the Office of the Surgeon General, Department of the Army, Washington 25, D. C. Army medical officers not on active duty should forward their applications to the Army Area Commander to whose jurisdiction they are assigned. National Guard medical officers should apply under current National Guard regulations.

Officers on active duty, submitting requests to attend courses, should give their name, rank, service number, and medical specialty; organization and station; and the course they wish to attend.

HEPATOLENTICULAR DEGENERATION TREATED WITH BAL

HAROLD A. LADWIG, *Lieutenant, MC, USNR*

THE initial description of the lesions seen in hepatolenticular degeneration was made by Wilson[1] in 1912. It is a rather rare disease with an unknown etiology and a tendency for familial occurrence. Hepatolenticular degeneration usually occurs in adolescence but the onset of symptoms has been reported in childhood as well as in the third and fourth decades of life. The onset is usually insidious with gradual progression over a period of years, but it may be sudden with a high irregular fever, rapid emaciation, and rapid progression to a fatal termination within a few months.[2] Tremor is usually the first symptom; is present in every case; and is seen in the head, trunk, and extremities, increasing with movement and emotional factors, but it is also present at rest.[3] Athetoid and choreic movements may also occur. There is hypertonia or rigidity of the musculature which may lead to contractures. Muscle wasting is seen in some patients. Deep reflexes are usually hyperactive; pathologic toe signs are usually not observed. There are no sensory changes. Dysarthria and dysphagia of a progressive nature are noted. The Kayser-Fleischer ring is pathognomonic but is not always present. Emotional disturbances in the form of involuntary laughing or crying may be present. Psychotic states and mental deterioration are frequently present in the terminal states.

PATHOLOGY

Hepatolenticular degeneration is characterized by the presence of bilateral, symmetrical degeneration of the lenticular nuclei which may be seen grossly as cavitation, the putamen being more severely affected than the globus pallidus. Cirrhosis of the liver is associated with the lenticular degeneration. The findings of liver-function tests may not be abnormal.

CLINICAL INVESTIGATIONS

Studies in hepatolenticular degeneration by Haurowitz[4] and Cumings[5] revealed an increased copper content in the liver and

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some areas of the brain, especially the basal ganglia. Cumings obtained copper values varying from 39.4 to 156.5 mg. per 100 grams of dried hepatic tissue in hepatolenticular degeneration as compared with the normal range of from 3.7 to 17.2 mg. for this tissue. The same investigator revealed that the copper content of the basal ganglia in this disease varied from 69.5 to 71.6 mg. as compared with the normal values of from 6.1 to 12 mg. per 100 grams. The Kayser-Fleischer ring seen in hepatolenticular degeneration is in part due to the deposition of copper in the cornea.[6]

Clinical investigation of copper metabolism following an injection of BAL in disseminated sclerosis and in a patient with hepatolenticular degeneration revealed an increased urinary excretion of copper in these patients as well as in normal subjects.[7] The greatest urinary excretion of copper was noted in the patient with hepatolenticular degeneration. Cumings[8] treated 4 patients with hepatolenticular degeneration with BAL and noted clinical improvement in 3. In the 5 patients with this disease reported by Denny-Brown and Porter[9] a marked increase in urinary excretion of copper was noted and beneficial effects were observed following treatment with BAL. They estimated that the net total copper mobilized during a 3-day course of BAL was about 3 mg. In the normal patient this would amount to about half the copper content of the liver; in hepatolenticular degeneration it is only about 5 percent of the hepatic copper content. These investigators concluded that the increased urinary excretion of copper observed even in the untreated patients with hepatolenticular degeneration probably reflects a disorder in the absorption of copper. This results in an excessive amount of the metal in the serum which, in turn, accumulates in the tissues and overflows a renal threshold. Recently Streifler and Feldman[10] administered BAL to a patient with advanced hepatolenticular degeneration and noted a striking clinical improvement. This was paralleled by a diminution of the patient's electroencephalographic abnormality.

BAL was introduced as an antidote to the arsenical vesicants.[11] The dithiol group of its molecule forms a relatively nontoxic compound with the arsenoxides and the nontoxic compound is rapidly excreted in the urine. Observations in subsequent studies revealed that BAL also promoted excretion of other metals, including copper.[12]

The following is a report on a patient with hepatolenticular degeneration treated with BAL.

CASE REPORT

A 29-year-old man stated that a tremor of the abdomen was first noted during a routine physical examination in 1945. He was

completely unaware of the tremor at the time. He was hospitalized for about 5 weeks and a diagnosis of combat fatigue was made. He considered this diagnosis unjustified and returned to his military duties until August 1949 at which time he was hospitalized because of weakness, malaise, and diarrhea. During the course of his hospitalization he had a tremor of his extremities, excessive perspiration, a palpable spleen and liver, and an elevated BMR. He was discharged with a diagnosis of viral hepatitis.

For his increased metabolic rate he was given a trial period of treatment with thiouracil. This did not alter his BMR significantly. From October through December he was given 0.1 gram of phenobarbital t. i. d. and 100 mg. of thiouracil daily. He was again admitted to the hospital on 9 February 1950 for further studies of his thyroid activity. On admission a tremor of his extremities and splenohepatomegaly were noted. His BMR was plus 29 and his total blood cholesterol was 170 mg. per 100 cc. The diagnosis was changed to hyperthyroidism without evidence of goiter, and the patient received 3 millicuries of radioactive iodine. Following this therapy he noted essentially no improvement of his tremor. His BMR was plus 8 and his blood cholesterol was 144 mg. per 100 cc.

In the course of the following year the patient noted an increase in the tremor of his extremities and subsequently was hospitalized. Because of his tremor he was seen by the neuropsychiatric service. Interviews revealed an obsessive compulsive personality structure and it was thought that this could be the cause of the tremor. He was returned to duty where he again noted an increase in the severity of his tremor and inability to perform his duties as a typist. These symptoms necessitated his admission to the United States Naval Hospital, Great Lakes, Ill., on 19 March 1952.

On admission the patient had a marked tremor of the head, abdomen, and upper extremities with increased tonus of all extremities. The tremor involved chiefly his right shoulder and left hand, increased on intention, disappeared almost completely when he was lying down, and was of a very coarse rhythmical nature having a rate of 3 or 4 oscillations per second. Examination of the eyes revealed a brown Kayser-Fleischer ring at the edge of both corneas. This was best demonstrated with a slit lamp. There was a slight bilateral exophthalmos. The liver was firm, not tender to palpation, and palpable 1 fingerbreadth below the right costal margin. Neurologic examination revealed a slight dysarthria. The patient was unable to sustain motor strength for prolonged periods. There was marked in-co-ordination of the upper extremities with diminished alternating movement

rate, more pronounced on the left. The in-co-ordination was due chiefly to the presence of the tremor. The reflexes in the upper extremities were hyperactive and equal. The abdominal reflexes were present in both upper regions; they were absent in the right middle and lower abdominal areas but present on the left in these areas. Cremasteric reflexes were present and equal bilaterally. Reflexes in the lower extremities revealed a hyperactive knee jerk on the right. Ankle reflexes were present and equal.

The patient's leukocyte count was 5,000 with a normal differential count. His hemoglobin was 13.5 grams and the hematocrit was 43 volumes per 100 cc. His nonprotein nitrogen was 38 mg. per 100 cc.; fasting blood glucose, 80 mg. per 100 cc.; total protein, 6.86 grams per 100 cc.; albumin, 4.12 percent; and globulin, 2.74 grams per 100 cc. His sulfobromophthalein retention was 2.87 percent at 47 minutes and 1.67 percent at 60 minutes. His serum bilirubin (Watson) at 1 minute was 0.1 mg. per 100 cc.; total 0.54 mg. per 100 cc. His thymol turbidity was 3.42 units; thymol flocculation, 1 plus; ammonium sulfate, 3.42 units; zinc sulfate, 8.38 units; choline esterase, 0.47 units; and cephalin-cholesteral flocculation, negative at 24 and 48 hours. His alkaline phosphatase was 3.08 Bodansky units. His urine coproporphyrins were 147.07 gamma per 24 hours.

On 12 March a liver biopsy was obtained. Microscopic examination of the tissue revealed gross alteration of the usual architecture of the liver tissue. The capsule was thickened due to a fibrosis and cellular infiltration consisting of lymphocytes for the most part. The parenchymal tissue consisted of roughly spherical nodules of hepatic cells which had lost most of their orientation around the central vein. These nodular masses were embedded in scar tissue which contained many small bile ducts and numerous lymphocytes and fibroblasts. There were occasional polymorphonucleocytes and eosinophils in these broad fibrous tissue septums. The hepatic cells themselves showed marked alteration. In some lobules there was marked vacuolization of cytoplasm due to an accumulation of fat; other lobules were completely free of fatty change. In many instances the hepatic cells contained two or three nuclei. The nuclei frequently were large, hyperchromatic, and contained a large eosinophilic vacuole. Although some lobules showed marked fatty degeneration, active necrosis of hepatic cells was not seen (fig. 1).

In May 1952, the patient was given 1 cc. of a 10 percent solution of BAL intramuscularly twice a day for 5 days. The dosage was then increased to 1.5 cc. twice a day for 5 more days. The patient stated that following the injection he felt lethargic at times and on two occasions he became quite nauseated with the medication. He reported that following this therapy his sleep was no longer interrupted by tremors and that he was able to drink coffee from a cup. He became more active following this course

of therapy and his physical capacities increased almost to their previous level. A second course of BAL was started in August. Immediately before this therapy the patient had again complained of extreme fatigue and an increase in tremor. During the second course of treatment he was given 1 cc. of a 10 percent solution of BAL twice a day for 3 days. This was increased to 1.5 cc. twice a day for 7 days. He experienced neither nausea nor leth-

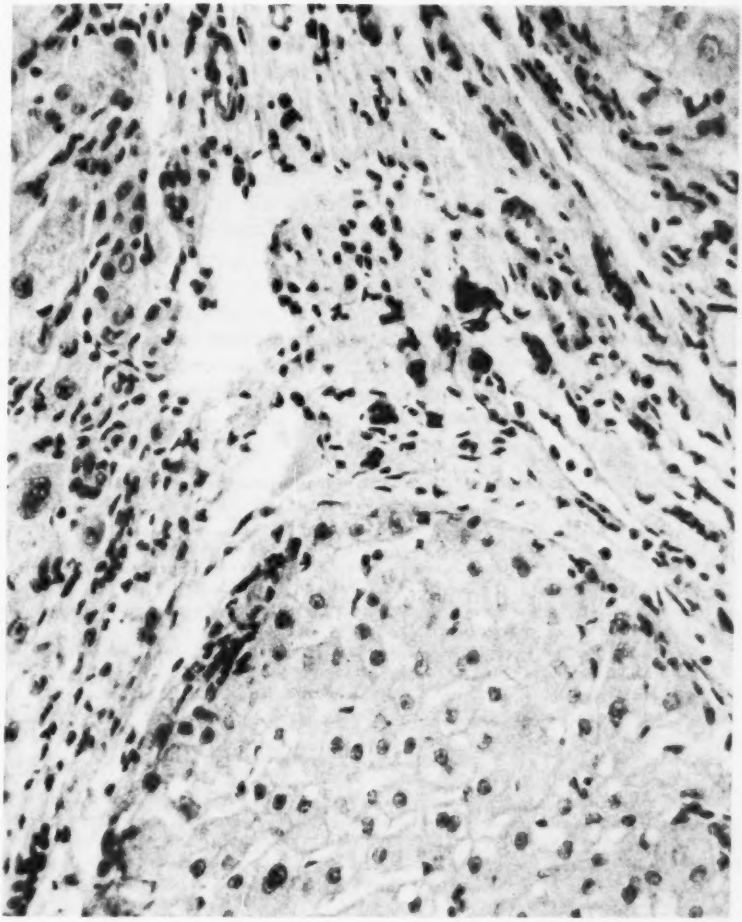

Figure 1. Photomicrograph showing the marked vacuolization of the hepatic cells. These cells have lost their normal pattern and many contain multiple nuclei. The fibrous tissue surrounding the parenchymal cells is infiltrated with lymphocytes and mononuclear cells. Small bile ducts are also seen in this area.

argy during the second course of therapy, but complained of some tenderness in the local area of the injection. He again noted an increase in his tolerance to physical exertion. Objective testing revealed minimal improvement of the tremor.

COMMENT

As is true with many neurologic conditions, the exact diagnosis was not made early in the course of the disease. Because of the presence of minimal neurologic findings in the form of a tremor, the patient was given a psychiatric diagnosis followed by psychotherapeutic interviews. This, too, is a frequent occurrence in the chronic neurologic disorders which are manifested by transient or minimal objective findings. Such patients may have emotional disorders disproportionate to the organic involvement of the nervous system and these tend to mask the disease. The difficulties in adequately assessing improvement, either subjective or objective, of any form of tremor are manifold, particularly because this symptom varies so readily with emotional stimuli.

SUMMARY

A patient with hepatolenticular degeneration was treated with BAL. Although he noted subjective improvement following this treatment, clinically the improvement in his tremor was minimal.

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GAS SHADOWS IN ROENTGENOGRAMS OF COLON

Their Significance in Strangulated Small Bowel Obstruction

CHARLES E. PARKINSON, *Captain, USAFR (MC)* (1)

THE gratifying improvement in the prognosis of acute obstruction of the small bowel that has been realized in the past decade and a half has been the result of early decompression by intestinal intubation, maintenance of the electrolyte balance, proper use of antibiotics, and early operation. The most important single factor is the speedy restoration of the continuity of the bowel lumen, and this generally depends upon prompt surgical intervention.

The diagnosis must be of sufficient precision and decision to justify a laparotomy. This decisive diagnosis of early intestinal obstruction is not always easy, for as Wangensteen (2) has so aptly stated, "The cardinal symptoms of obstruction are three; pain, vomiting, and distension * * * but these complaints are so much a part of all acute abdominal lesions that their occurrence affords no satisfactory distinguishing characters."

The clinician, faced with the recognized necessity of early and accurate diagnosis seeks all possible aid. Since Case (3) first described the significance of gas shadows in detecting ileus, the "flat film" of the abdomen has earned an important place in the diagnosis of obstruction. The value of roentgenographic examination in differentiating adynamic, (reflex or paralytic) ileus from mechanical ileus is well established. The basic roentgenographic differentiation of these two forms of ileus rests largely upon the greater degree of distention of intestinal loops, and the absence of gas in the large bowel that is seen in mechanical ileus. It is not as generally recognized that in mechanical ileus complicated by strangulation, considerable amounts of gas may persist in the large bowel, and

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(2) Wangensteen, O. H.: Intestinal Obstructions. 2d edition. Charles C Thomas, Publisher, Springfield, Ill., 1947. p. 98.

(3) Case, J. T.: New aid in early recognition of post-operative ileus. J. Michigan M. Soc. 19: 151, Apr. 1920.

further that this persistent gas distal to the point of obstruction is in itself suggestive of strangulation.

The case of obstruction due to enteric intussusception reported in this article was seen in July of 1952. In September of 1952, Rigler and Mellins *(4)* reported their study of a large number of strangulating obstructions of the small intestine and presented a synopsis of the roentgen signs suggesting this entity. They pointed out that strangulated obstructions generally present one or more of these signs: (1) coffee-bean shaped gas shadows due to closed loops; (2) pseudotumors due to fluid-filled loops; (3) absence of mucosal pattern; (4) fixation of distended loops; and (5) moderate amounts of gas in the colon.

The clinical findings suggesting strangulation in obstruction are due to peritoneal irritation resulting from the liberation of bloody fluid from the infarcted segment of intestine. In the first case report there were no clinical signs of strangulation for, as Wangensteen *(2)* points out, "An intussusception may be unattended by rebound tenderness because the infarcted intestinal segment lies within a normal ensheathing cylinder; hence, bloody fluid may not escape into the peritoneal cavity." In this patient there was no opportunity for the highly diagnostic "coffee-bean" sign of closed loops to form. It is interesting to note that persistent gas in the colon, in the presence of other signs indicating small bowel obstruction, was the most significant diagnostic finding from the roentgen point of view. The first interpretation of this finding as indicative of incomplete obstruction was not only erroneous but would have been extremely dangerous if it had not been re-interpreted and judged to be consistent with complete obstruction in the presence of strangulation.

CASE REPORTS

Case 1. A 22-year-old woman was admitted to the hospital because of abdominal pain of approximately 8 hours' duration followed by nausea. Eighteen days before she had been operated upon for suspected acute appendicitis. An essentially normal appendix was found and removed. Evidence of mesenteric lymphadenitis was noted and it had apparently accounted for the patient's symptoms. Before closing the abdomen, an uninfected Meckel's diverticulum was found and resected. The surgeon recorded that after diverticulectomy the defect in the ileum was closed without impairment of the intestinal lumen. Her postoperative course had been uneventful until the onset of the present illness.

(4) Rigler, L. G., and Mellins, H. Z.: Paper presented before the Fifty-Third Annual Meeting of the American Roentgen Ray Society, Houston, Tex., 23 Sept. 1952.

The presenting symptom was pain, intermittent in character, and centered in the periumbilical area. A few hours after its onset she became nauseated but did not vomit. The intensity of the pain progressed for several hours, then diminished to a constant, low-grade aching pain that supplanted the colicky intermittent pain. The abdomen was diffusely tender without signs of peritoneal inflammation. Her temperature was 99° F. At the time of physical examination, approximately 9 hours after onset of pain, the opinions of several observers varied as to the presence of peristalsis. The leukocyte count was 10,800 with a mild shift of the Schilling count to the left.

A flat roentgenogram of the abdomen demonstrated a few loops of mildly distended small bowel and considerable gas in the cecum, which was interpreted as consistent with incomplete mechanical ileus. Two hours later, a second roentgenogram of the abdomen (fig. 1), showed some increase in small bowel distention although the cecal gas remained constant, as did the position of the distended loops. This was interpreted as representing evidence of complete small bowel obstruction. It was believed that the persistent cecal gas suggested bowel stasis distal to the point of obstruction, most likely due to intra-abdominal inflammation or to a segment of strangulated intestine.

Surgical exploration revealed an enteric (ileal) intussusception at the point of the previous diverticulectomy. The intussusceptum was devitalized and a resection of about 16 cm. of ileum was performed with end-to-end anastomosis. The patient recovered without complications and her subsequent course has been uneventful.

Case 2. A 19-year-old woman was admitted to the hospital with a history of previous "ovarian surgery" and a present illness clinically typical of acute small bowel obstruction of 10 hours' duration. The roentgenogram (fig. 2) is of interest because, in addition to considerable large bowel gas, there is a typical "coffee-bean" shaped gas shadow. At operation she was found to have strangulated obstruction due to adhesions, and a gangrenous intestinal segment requiring resection and anastomosis.

Case 3. A 30-year-old woman was admitted to the hospital because of severe left lower quadrant pain of 6 hours' duration. Her past history included an appendectomy and partial left oophorectomy for "cysts" 6 years prior to this admission.

She had experienced nausea, but no vomiting. The pain was described as sudden in onset, persistent, and steady, with

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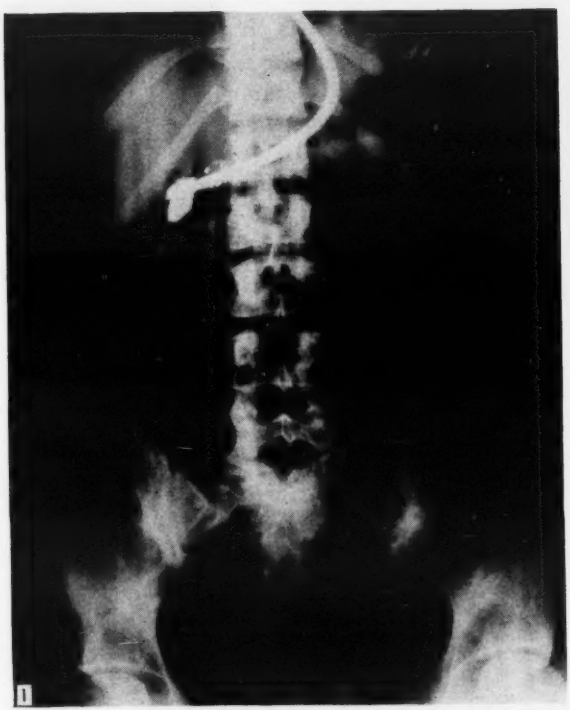


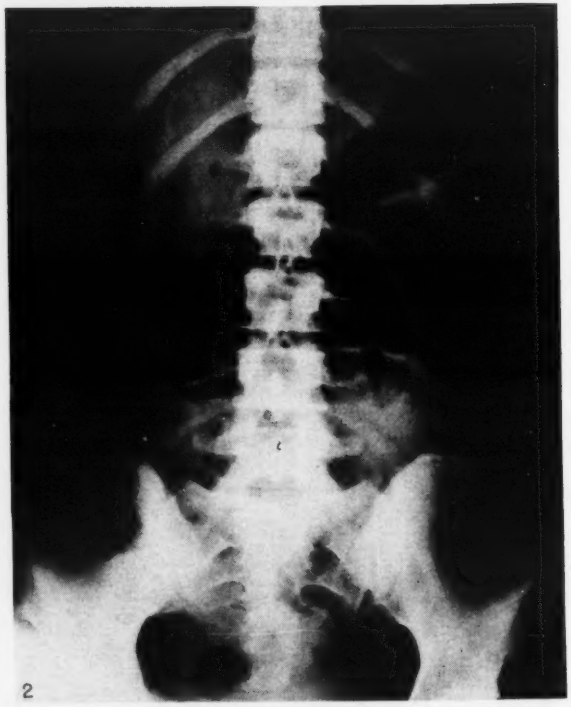


Figure 1. Cecal gas shadows are present with other evidence of intestinal obstruction (ileal intussusception). Figure 2. Note cecal gas shadows and "coffee-bean" gas shadow.

intermittent exacerbations of intensity. Her abdomen was diffusely tender and rebound pain was present. Her menstrual periods had been regular and her next period was impending. Shortly after admission vaginal bleeding was noted for the first time. Pelvic examination revealed exquisite tenderness and a mass in the left adnexal area about the size of a lemon.

Figure 3. This roentgenogram shows gas in the colon and a fluid-filled loop and evidence of free fluid in the pelvis.

A catheterized urine specimen was negative. The leukocyte count was 14,500 and the red blood cell count was 3.5 million.

A roentgenogram of the abdomen (fig. 3) revealed a C-shaped loop of dilated small bowel, a fluid-filled loop and free fluid in the pelvis, and considerable gas in the colon. (She had not been given an enema.) The preoperative clinical diagnoses were (1) ruptured ectopic pregnancy and (2) twisted ovarian cyst. At operation a strangulated loop of ileum was found caught

between adhesive bands. This segment returned to its normal physiologic state upon release of the adhesive bands and the application of warm saline packs. Resection was not necessary.

SUMMARY

Roentgen evidence of considerable gas in the colon may exist in the presence of small bowel obstruction. In some instances this finding not only fails to rule out mechanical ileus, but may be highly suggestive of strangulating obstruction. A patient is presented in whom an infarcted ileal intussusceptum was ensheathed by uninfarcted ileal intussuscipiens and, therefore, failed to present the clinical signs of strangulated obstruction, (peritoneal irritation). The roentgen study suggested the infarction which was proved at operation. Two other case reports in which considerable large bowel gas was noted in the presence of mechanical small bowel obstruction are summarized.

DEXTRAN IN LIEU OF PLASMA

Army SGO Circular Letter No. 89 announces that 6 percent dextran in saline solution is now available as a substitute for plasma for clinical use in restoration and maintenance of blood volume. Because of its comparative higher cost, the known relationship between homologous serum hepatitis and plasma infusion, and the current need of plasma for the production of specific globulins, plasma should be used to support blood volume only when dextran is unavailable.

The relationship of chronologic age and types of motivation leading to ineffective flying performance seems definite and substantial. But the same cannot be said for the psychologic area of fear of flying. It is not clear from this study (aging in Air Force pilots) what variable or variables other than chronologic age build up fear behaviors in aircrewmen.

WALTER R. MILES and BEATRICE M. SHRIVER
in *Journal of Gerontology*

BOMBARDIER'S PALSY

Report of a Case

PAUL E. WRIGHT, *Lieutenant Colonel, USAF (MC)*

JAMES H. BRAATZ, *Second Lieutenant, USAF (MSC)*

BOMBARDIER'S palsy is a term applied to an occupational illness characterized by paralysis of the muscles supplied by the deep peroneal nerve and resulting in foot drop. This condition occurs as a result of kneeling over an aircraft bombsight for variable periods. The only aircraft in which the bombardier is required to perform his duties in the kneeling position is the B-26 (light bomber). In other types of aircraft he assumes the sitting position.

The direct cause of this paralysis was believed to be due to pressure or tension on the peroneal nerve in the vicinity of the knee.[1]

CASE REPORT

A B-26 bombardier reported to the flight surgeon's office on 10 December 1952 because of weakness in the right leg and difficulty in walking, which had become more disabling after each practice bombing mission. He was hospitalized and given vitamin B complex and physical therapy exercises for the dorsiflexor muscles of the right ankle, stretching of the gastrocnemius and soleus muscles, and the Kabat-Kaiser mass movement and knee-ankle exercise to the point of fatigue. Improvement was fairly rapid (table 1) and the patient returned to flying duty on 29 December 1952.

On 14 January 1953, the patient returned with his original complaint following his first flight as bombardier. The mission was of 3½ hours' duration and he had been in a kneeling position 5 minutes out of each 12. He was grounded for 60 days to allow complete healing of the injured nerve and the same treatment was resumed. Examination at this time revealed partial right foot drop, with moderate loss of power in the anterior tibial muscles. He walked quite well on the balls of his feet but had difficulty with the right foot when he attempted to walk on his heels. There were no muscle atrophy or masses along the course of the peroneal nerve. The dorsalis pedis pulses were normal and

From U. S. Air Force Hospital, Langley Air Force Base, Va. Adapted from an article published in the Tactical Air Command *Air Surgeon's Bulletin*, May 1953.

equal bilaterally. Sensory findings and tendon reflexes were normal. No pathologic reflexes were elicited.

TABLE 1. *Muscle response to physical therapy exercises*

Muscle	11 December 52	18 December 52	31 December 52
	Degree of function		
Tibialis anterior	Trace	Good	Good+
Extensor hallicus longus	Trace	Fair+	Good
Extensor digitorum longus	Poor	Good+	Normal
Extensor digitorum brevis	Trace	Good	Good+
Peroneus group	Normal	Normal	Normal

He again improved rapidly and by 26 January 1953 all physical findings were normal. When he was observed in the kneeling position in the aircraft, the flight surgeon concluded that the nerve injury resulted from pressure or tension on the peroneal nerve. A modified basketball kneepad (fig. 1) was applied to the right knee to reduce the possibility of direct pressure on

Figure 1. Improvised basketball kneepad used to protect affected knee.

the nerve. This pad was tested in the aircraft by gradually increasing the time spent in the kneeling position required in bombing missions until symptoms recurred or he was able to finish the required period without symptoms. He began his simulated duty position by alternating 5 minutes of kneeling with 5 minutes of rest, and increased the number of kneeling and resting periods. His symptoms recurred after a total of 30 minutes kneeling. The former treatment was resumed until all symptoms subsided, and the patient was transferred to another type of aircraft which required no kneeling.

SUMMARY

There is evidence that the paralysis of bombardier's palsy is not due to direct pressure of the knee on a solid object, but to a stretching or tension of the nerve. This condition will not be a serious problem in the future because the B-26 is the only Air Force aircraft in which the bombardier kneels to perform his duties.

REFERENCE

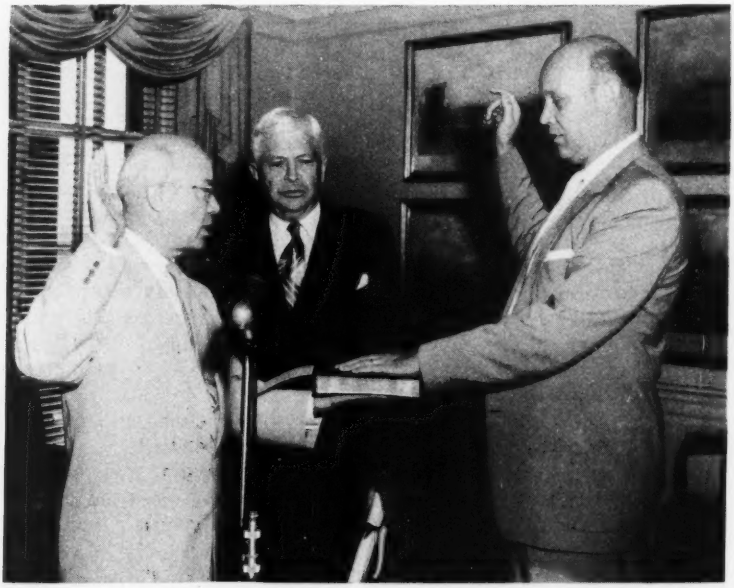
1. Laird, G. J., and Mueller, M. J.: Bombardier's palsy. *The Air Surgeon's Bull.* (No. 9) 1: 19, Sept. 1944.

The question of frequency of health examinations often comes up. The answer lies in the average age of the executives. If over 40, examinations certainly should be done annually. It must be stressed above all that regular calendar examinations must be supplemented by an understanding by the examinee that occurrence of symptoms of any kind deserves immediate investigation. It is natural that he should report to the physician who has last done a periodic health examination, and who has stressed to him that the periodic examination program detects long-run health trends rather than acute emergencies which are heralded by the appearance of new and unusual clinical symptoms. Finally, it must be stressed that the success of the program depends largely upon the thought, consideration and effort expended by the physician himself. This important factor must never be minimized in any program of periodic health examinations.

—FREDERICK H. SHILLITO, M. D.,
in *Annals of Internal Medicine*

Dr. Melvin Casberg Appointed Assistant Secretary of Defense

On 28 July 1953 President Eisenhower appointed Dr. Melvin A. Casberg Assistant Secretary of Defense (Health and Medical). He is the first physician to be chosen for this newly-created high office in the Department of Defense.



Dr. Melvin A. Casberg, right, is shown being sworn in as Assistant Secretary of Defense (Health and Medical) in a ceremony at the Pentagon, 3 August 1953, witnessed by Secretary of Defense Charles E. Wilson, center. Mr. John E. Moore, Director of Personnel, OSD, administered the oath.

Following military service during World War II with the U. S. Army in North Africa and China, Dr. Casberg practiced in Long Beach, Calif. In 1949 he became Dean of St. Louis University School of Medicine, his Alma Mater, and on 1 April 1952 was appointed Chairman of the Armed Forces Medical Policy Council. When the Council was dissolved in April of this year, he was named Assistant to the Secretary of Defense (Health and Medical).

He is a Fellow of the American College of Surgeons, a member of Alpha Omega Alpha, and is certified by the American Board of Surgery.

ALLERGIC ECZEMATOUS CONTACT-TYPE DERMATITIS DUE TO "PRO-KIT" CONTENTS

MORTON P. LAZAR, *Captain, MC, USA (1)*

DURING the 12-month period ending December 1952, 9 patients with an allergic eczematous contact dermatitis due to the Individual Chemical Prophylactic Packet (pro-kit) contents used by members of the Armed Forces were admitted to this hospital. The following is a representative case.

CASE REPORT

A 23-year-old man was admitted with a transfer diagnosis of dermatophytosis of the genitocrural area. About 24 hours after using a pro-kit, he first noticed redness in the areas where its contents had been applied. His erythema progressed to an acute, oozing, eczematous dermatitis and he became so uncomfortable he was unable to walk or sleep. No treatment had been given before admission, which was 60 hours after using the pro-kit. Any movement of the lower extremities caused great pain and discomfort so that the patient remained fairly rigid. The only positive finding was an acute oozing eczematous dermatitis of his penis, scrotum, the upper and medial aspects of his thighs, and the pubic region (fig. 1). With the aid of Burow's solution, sitz baths, bed rest, and finally some lubricating medications, the eruption cleared and only hyperpigmentation remained. After 15 days' hospitalization he was discharged.

DISCUSSION

Conventional closed patch testing *(2, 3)* was done on the patient reported and on 8 other patients seen in this hospital. Positive patch test response was observed in each patient following contact with calomel and ammoniated mercury which, in addition to the histories and physical findings, established the diagnosis.

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(1) Formerly Osaka Army Hospital, Japan; now 594 Melody Lane, Highland Park, Ill.

(2) Sulzberger, M. B., and Wise, F.: Contact or patch test in dermatology; its uses, advantages and limitations. Arch. Dermat. & Syph. 23: 519-531, Mar. 1931.

(3) Schwartz, L.; Tulipan, L.; and Peck, S. M.: Occupational Diseases of the Skin. 2d edition. Lea & Febiger, Philadelphia, Pa., 1947.

Allergic eczematous contact dermatitis due to various types of mercurials is well known. The condition of pro-kit dermatitis is so characteristic in its morphology and topographic features that the diagnosis can often be made solely on inspection with minimal difficulty. The basic type of eruption is that of an eczematous type of dermatitis involving all the areas to which the pro-kit contents are applied. In addition to the basic ef-

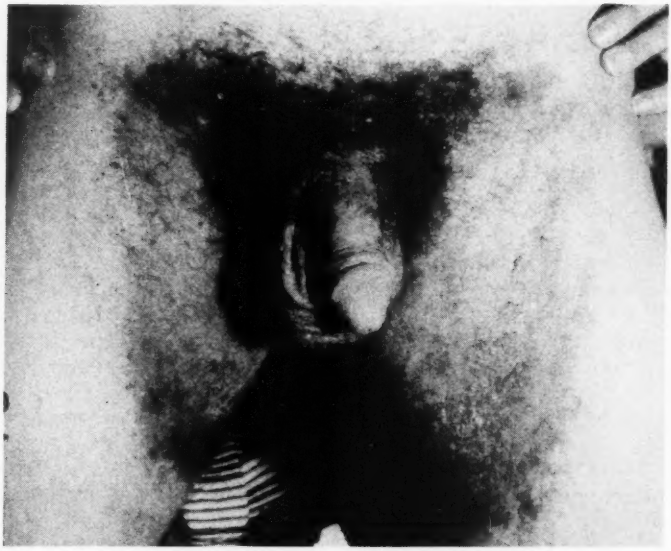

Figure 1. "Pro-kit" dermatitis (basic eruption) in subacute eczematous stage. Photograph was taken 72 hours after patient was admitted to the hospital.

florescence there was involvement of the neck, axillas, anticubital space, wrist, popliteal space, and abdominal folds. The eruption in these areas consisted of small, erythematous macules, papules, and eczematous lesions. In the more allergic patients the eczematous lesions became confluent but still were confined to the flexural areas. The mildest type of eruption was a simple but persistent erythema. One of the patients presented a more widespread eruption, characterized by an almost universal dermatitis in conjunction with the basic eruption. In each instance the basic eruption invariably was the most severe component of the efflorescence. Any of the ingredients of the kit, particularly sulfathiazole, could be an allergen, but this drug was not implicated in any of the cases reported.

This entity has been recognized by many physicians but no reference to this condition could be found in the literature.

Patients with pro-kit dermatitis may have been misdiagnosed in the past. The referring diagnoses in the 9 patients seen in this hospital were: dermatophytosis (2), heat rash (3), moniliasis (2), and dermatitis of unknown cause (2). The failure to recognize dermatitis due to pro-kit material may have been due to a low index of suspicion. Most physicians questioned knew little about the kits or their contents or instructions.

The widespread aspect of this dermatosis is believed to be due to absorption either from the local eruption or from the material instilled into the urethra, or both. Absorption and dissemination of the allergen via the circulatory system to distant areas of the shock organ (the skin) results in the generalized aspect of the condition. This tends to support the views that a reaction in previously sensitized skin may be elicited by the allergen applied externally or brought to the site via the blood stream.

Certain skin areas, because of anatomic and physiologic peculiarities, were more susceptible to the eruption as shown by the predilection of the dermatitis for the flexural areas and the lack of involvement of the hands which were exposed in all patients. Perhaps the hands were not involved because of the thickened keratin or excessive sweating, or because the allergen was removed by washing before it could cause difficulty. Trauma from the use of the wet soap-impregnated cloth and additional trauma theoretically may increase the number of acquired allergic hypersensitivities. The physiologic and traumatic changes associated with coitus may add to these sensitivities. Well-performed studies in the field of contact allergy have shown that trauma tends to increase the number of acquired allergic hypersensitivities.

SUMMARY

An allergic, eczematous, contact-type dermatitis heretofore unreported, was traced in 9 patients to chemicals contained in the standard venereal prophylactic kit.

"The Art of Medicine"

The physician who is guided by the aphorism "Why speak, if you can keep silent?" knows a great deal about the true art of medicine. The seasoned doctor knows not only what to say to his patients, but also what to leave unsaid.

It has been pointed out that experience is of no ethical value; it is the name that men give to their mistakes. Experienced physicians are usually content to say very little to their patients other than giving general reassurance and simple, immediate instructions. They have learned the best way to avoid raising doubts and fears.

This is a difficult lesson for the young physician to learn. The value of silence is not immediately apparent; in fact, it is often foreign to him. As a student and house officer, he is taught to display his knowledge. Unfortunately, he is asked at times in the presence of the patient to mention differential diagnosis, or suggest possible diagnostic procedures. His instructors are careless about what they say in front of patients—in other words, of how they practice the art of medicine.

Besides the fact that keeping silent is new, it is also difficult because of the temptation every young doctor has to prove himself by displaying his knowledge to his new patients. He sometimes forgets that trusting patients credit the physician with cognizance of all possibilities, and that the patient is not the professor demanding a complete list of facts. He must remind himself that the patient is like a child asking for a simple answer or sometimes only a reassuring look or touch. Like the child, he is confused and bewildered when more is offered.

The art of medicine is difficult to define, and consequently difficult to teach. Yet it must not be neglected, for it is more important than the ability to make the most accurate diagnosis or prescribe the most effective antibiotic. The expensively educated young physician, though he may have academic qualifications beyond question, is indeed a poor physician until he has discovered the priceless gold of silence.

—FRANK A. HOWARD, Lieutenant (jg) MC, USNR
in *New England Journal of Medicine*

Association of Military Surgeons Meeting, 9 - 11 November 1953

The 60th annual meeting of the Association of Military Surgeons of the United States will be held at the Statler Hotel, Washington, D. C., 9-11 November 1953 under the presidency of Rear Admiral Winchell McK. Craig, MC, USNR, of Rochester, Minn. Officers of the Army, Navy, and Air Force and prominent members who will participate in the program, and the subjects of their presentations, include:

9 November

Recent Advances in Military Medicine—Maj. Gen. George E. Armstrong, MC, USA, Surgeon General, Department of the Army.

Military Medicine of the Future—Rear Adm. Lamont Pugh, MC, USN, Surgeon General, Department of the Navy.

Military Medicine and the Air Force—Maj. Gen. Harry G. Armstrong, USAF (MC), Surgeon General, Department of the Air Force.

Military Medicine and the U. S. Public Health Service—Surg. Gen. L. A. Scheele, U. S. Public Health Service, Department of Health, Education, and Welfare.

Current Medical and Hospital Program of the Veterans Administration—Vice Adm. Joel T. Boone, MC, USN (Ret.), Medical Director, Veterans Administration.

Recent Advances in Military Dentistry—Rear Adm. Ralph Malone, DC, USN, Inspector General Dental, Bureau of Medicine and Surgery, Department of the Navy.

Recent Advances in Military Nursing—Col. Verena M. Zeller, USAF (AFNC), Chief, Air Force Nurse Corps.

Recent Advances in Military Veterinary Medicine—Brig. Gen. J. L. Hartman, VC, USA, Chief, Veterinary Corps, Department of the Army.

Recent Contributions of Women Medical Specialists to Military Medicine—Col. Nell Wickliffe, WMSC, USA, Chief, Women's Medical Specialists Corps, Department of the Army.

Recent Contributions of Medical Service Corps to Military Medicine—Col. Jack Buell, USAF (MSC), Office of the Surgeon General, Department of the Air Force.

The Reserve Force Policy Board and Its Relation to the Medical Service Reserve Programs—Maj. Gen. Hugh Milton, II, USA, Executive for Reserve and ROTC Affairs, Office of the Chief of Staff, Department of the Army.

Training in Military Medicine for Reservists—Col. William S. Stone, MC, USA, Commandant, Army Medical Service Graduate School, Washington, D. C.

The Symposia at Armed Forces Medical Installations—Capt. M. H. Porterfield, MC, USNR, Bureau of Medicine and Surgery, Department of the Navy.

Use of Cortisone in Treatment of Chorioretinal Damage Resulting From Observation of Atomic Detonation—Capt. Arthur L. Chambers, II, USAR, New York, N. Y.

Current Status of Research in the Treatment of Burns—Col. William H. Amspacher, MC, USA, Brooke Army Medical Center, Fort Sam Houston, Tex.

10 November

Transmission of Physiological Data by Ultra-High Frequency Radio—Comdr. Norman Lee Barr, MC, USN, Naval Medical Research Institute, Bethesda, Md.

Research in Submarine Medicine—Capt. Charles W. Schilling, MC, USN, U. S. Naval Academy, Annapolis, Md.

Wound Ballistics and Body Armor—Lt. Col. Robert H. Holmes, MC, USA, and Maj. William F. Enas, MC, USA, Armed Forces Institute of Pathology, Washington, D. C.

Human Factors in High Performance Aircraft—Col. Donald D. Fleckinger, USAF (MC), Air Research and Development Command, Baltimore, Md.

Rapid Methods for Determining Antimicrobial Action of Chemotherapeutic Agents—Capt. William E. Dye, USAF (MSC), U. S. Air Force School of Aviation Medicine, Randolph Air Force Base, Tex.

Experimental Development of Freeze-Dried Artery Grafts: An Illustrated Presentation—Capt. Wilbur E. Kellum, MC, USN, Commanding Officer, Naval Medical Research Institute, Bethesda, Md.

Clinical Experience with Freeze-Dried Arterial Homographs—Capt. R. B. Brown, MC, USN, U. S. Naval Hospital, Bethesda, Md.

The Use of Large Blood Transfusions in the Severely Wounded—Lt. Col. William H. Crosby, MC, USA, Army Medical Service Graduate School, Washington, D. C.

Front Line Surgery in Korea—Comdr. Roald N. Grant, MC, USN, U. S. Naval Hospital, St. Albans, N. Y.

11 November

Psychiatric Selection for Military Service—Capt. George Raines, MC, USN, U. S. Naval Hospital, Portsmouth, Va.

Decontamination of Food Stuffs After Atomic Contamination—Lt. Col. Bernard F. Trum, VC, USA, Oak Ridge, Tenn.

Medical Section Panel

Medical Manpower - Needs and Utilization—Dr. E. L. McCormick, President, American Medical Association.

Medical Manpower and Utilization - OSD Viewpoint—Dr. Melvin A. Casberg, Assistant Secretary of Defense (Health & Medical).

Federal Health Personnel - Needs and Utilization—Brig. Gen. Howard A. Rusk, USAF (MC), Chairman, Health Resources Advisory Committee.

Dental Section Panel

Surgical Correction of Mandibular Deformities—Col. Jack B. Caldwell, DC, USA, Walter Reed Army Medical Center, Washington, D. C.

Freeze-Dried Bank Bone and its Application in Clinical Oral Surgery—Comdr. C. H. Blackstone, DC, USN, National Naval Medical Center, Bethesda, Md.

Studies on Distribution of Minerals in Bone by Use of Tracer Techniques—Lt. Col. Norman O. Harris, USAF (DC), Randolph Air Force Base, Tex.

Nursing Section Panel

Improved Patient Care Through Development of Nursing Service Personnel—Maj. Margaret E. McKenzie, USAF (AFNC), Office of the Surgeon General, Department of the Air Force; Lt. Esther L. Schmidt, NC, USN, U. S. Naval Hospital, Bethesda, Md.; and Maj. Harriet Werley, ANC, USA, Office of the Surgeon General, Department of the Army.

Women's Medical Specialist Corps Section Panel

Human Relations - Vital to Program Effectiveness—Brig. Gen. Paul I. Robinson, MC, USA, Commanding General, Fitzsimons Army Hospital, Denver, Colo.

Human Relations as Relating to the Programs of Dietetics, Occupational Therapy, and Physical Therapy.
Capt. Elizabeth M. Nachod, WMSC, OT, USA, Walter Reed Army Hospital, Washington, D. C.
Lt. Col. Audrey Underkofler, USAF (WMSC), Office of the Surgeon General, Department of the Air Force.

Veterinary Section Panel

Leukocyte and Platelet Transfusion in Irradiation Aplasia of the Dog Bone Marrow—Comdr. E. P. Cronkite, MC, USN, Naval Medical Research Institute, Bethesda, Md.

Teschen Disease (Swine Encephalomyelitis, A Review of Its Diagnosis, Epizootiology, and Control)—Lt. Col. T. C. Jones, VC, USA, Armed Forces Institute of Pathology, Washington, D. C.

Mycological Aspects of Hyperkeratosis—Lt. Col. Walter T. Carll, VC, USA, Washington, D. C.

Medical Service Corps Section Panel

Sanitary Engineering Program in U. S. Army—Lt. Col. S. J. Weidenkopf, MSC, USA, Office of the Surgeon General, Department of the Army.

Industrial Health Program in U. S. Navy—Lt. Comdr. G. A. L. Johnson, MSC, USN, Bureau of Medicine and Surgery, Department of the Navy.

Sanitary and Industrial Hygiene Engineering Program in U. S. Air Force—Lt. Col. Jack C. Carmichael, USAF (MSC), Office of the Surgeon General, Department of the Air Force.

Pharmacy Section Panel

The American Pharmaceutical Association—Col. Royce Franzoni, MSC, USAR, President, American Pharmaceutical Association.

Training and Utilization of Pharmacists in the Army—Lt. Col. Henry D. Roth, MSC, USA, Office of the Surgeon General, Department of the Army.

Utilization of Pharmacists in the Air Force—Lt. Col. Elliott P. Rigsby, USAF (MSC), Washington, D. C.

Utilization and Training of Pharmacists in the Navy—Lt. Comdr. K. E. Bechtloff, MSC, USN, National Naval Medical Center, Bethesda, Md.

Veterans Administration Pharmacy—Lt. (jg) Vernon O. Trygstad, MSC, USNR, Veterans Administration, Washington, D. C.

BOOK REVIEWS

Encyclopedia of Aberrations, A Psychiatric Handbook, edited by *Edward Podolsky,* M. D., State University of New York Medical College. With a Foreword by *Alexandra Adler,* M. D., New York University College of Medicine. 550 pages; illustrated. Philosophical Library, New York, N. Y., publishers, 1953. Price $10.

This rather unusual book represents the contributions of more than 50 recognized authorities in the field of psychiatry along with carefully selected material from the present-day literature. The subjects are alphabetically arranged for quick reference and the authors in their presentations cover nearly the entire field of psychopathology, beginning with the subject of "abasia," and ending properly enough with "zoösadism." The text of the articles vary from single-line definitions of the more obscure psychiatric terms to informative discourses of varying length on a host of subjects. The material is given in a comprehensive and concise form, and contains information that is usually difficult to find unless one has access to a complete and somewhat voluminous library on psychopathology. The presentations that pertain to the aberrations as related to forensic psychiatry are indeed interesting and will prove most useful in practical courtroom application as well as elsewhere. Character disturbances in children, as well as the recent spread of narcotic addiction among delinquents, are covered in a comprehensive manner. The newer biologic and chemical concepts of schizophrenia and manic depressive psychosis, as well as the recent investigations in the field of the physiologic considerations of psychiatric disorders is presented. Freud's concepts of the sexual aberrations, along with the more modern psychoanalytical schools of thought are compactly given in a most instructive manner. Such interesting subjects as "The Mind of the Murderer;" "Nun's Melancholy;" "Suicide and Murder as Defenses;" and "Post-Orgastic Emptiness;" are but random topics that are given in a most fascinating and informative manner. Even the most erudite psychiatrist will find much to learn in this most worthwhile and unique volume, and as such it is strongly recommended.

—*Lt. Col. C. T. Brown, MC, USA*

Morris' Human Anatomy, A Complete Systematic Treatise, edited by *J. Parsons Schaeffer*, A. M., M. D., Ph. D., Sc. D., D. Litt., Professor of Anatomy, and Director of The Daniel Baugh Institute of Anatomy, Emeritus, Jefferson Medical College. The Contributors: *Leslie B. Arey*, Northwestern University; *Raymond F. Blount*, University of Texas; *Eliot R. Clark*, University of Pennsylvania; *Harold Cummins*, Tulane University; *J. C. B. Grant*, University of Toronto; *Fredrick Gudernatsch*, Formerly Cornell University Medical College; *Ernest Lachman*, University of Oklahoma; *Olof Larsell*, University of Minnesota; *J. E. Markee*, Duke University; *Bradley M. Patten*, University of Michigan; *Richard E. Scammon*, University of Minnesota; *J. Parsons Schaeffer*, Jefferson Medical College; *C. G. Smith*, University of Toronto; *Robert J. Terry*, Washington University; and *Mildred Trotter*, Washington University. 11th edition. 1,718 pages; illustrated. The Blakiston Co., New York, N. Y., publishers, 1953. Price $16.

Although this book could be used as a text, it is primarily for reference. Some changes in spelling and nomenclature, which are readily understood and create no difficulty, have been made and, with few exceptions, the BNA terminology is used throughout. Reference is made in the preface to the use of smaller type and to the presentation of certain material in double columns as being helpful to the reader, but I did not find it so. A short historical sketch of the text and accomplishments of the original author is included.

The illustrations, diagrams, and roentgenograms are excellent, presenting in minute detail the sections they depict. The book consists of 12 sections, and the titles of the sections and grouping of descriptions are a departure from that usually encountered in texts on anatomy. For example, instead of a section on syndesmology, it is called "The Articulations," because it excludes those ligaments which are not concerned with an articulation. The first section on developmental anatomy is outstanding. A discussion of the embryology and a bibliography of the subject matter are included in each division of the text. An interesting feature is the numerous paragraphs on the clinical aspects of anatomic relationships scattered throughout the text. In the section on musculature, the muscles are considered on a regional basis, but at the end of the section they are classified according to function. This is a valuable reference because the muscles involved in any movement of the body can be readily determined. The presentation on the embryology of the heart and vascular system is thorough and fairly complete, and adds to the understanding of developmental anomalies and variations. The illustrations in the section of "The Nervous System" are especially good and readily understood. The section on "The Respiratory System" included much material of recent discovery and the illustration of bronchioles and subdivisions of the lung present ready reference material.

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There is a good index with cross indexing which makes it easier to find the subject desired. I strongly recommend this book to those interested in the relation of basic anatomy to clinical medicine.—*Comdr. E. P. McLarney, MC, USN*

Stress and Disease, by *Harold G. Wolff,* M. D., Professor of Medicine (Neurology), Cornell University Medical College; Attending Physician, New York Hospital, New York, N. Y. American Lecture Series, Publication Number 166, A Monograph in the Bannerstone Division of American Lectures in Physiology, edited by *Robert F. Pitts,* M. D., Ph. D., Professor of Physiology and Biophysics, Cornell University Medical College, New York, N. Y. 199 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953.

In this book the author delineates the background of his thesis that inappropriate responses to threat, especially those involving values and goals, can damage or destroy man. He considers Calude Bernard's concept of homeostasis only a partial answer to the problem. In an emergency situation homeostasis has potential value, but damage and perhaps destruction of the organism may result when the homeostasis mechanism is inappropriately elicited by symbols and is long sustained. Stress is defined as the "interaction between external environment and organism, with the past experiences of the organism as a major factor." This monograph is written with three major divisions and an epitome, the majority of the text being allotted to the experimentally observed effects of stress in man. The author draws upon material (much of it previously published in separate papers) that was obtained at the New York Hospital, and coordinates his experimental results to support the major thesis.

The volume is significant for two reasons: the emphasis given social factors in the cause and exacerbation of disease processes and the dramatic demonstrations of the effects of emotional vicissitude upon bodily processes. Whether or not other clinics continue to substantiate Wolff's thesis, the general practitioner, as well as the specialist, will do well to heed the holistic concept of disease as presented by Wolff, and look again at the patient rather than the illness each is attempting to treat.

The author closes with the following thought: "Whether appropriately or inappropriately used, adequate and protective patterns operate only in relation to the present, in a manner determined by the past, and often with dangerous consequences for the future. In all events, there is help in our knowledge, since we now begin to know what price we pay for a way of life. There are many things more important than comfort, and a few even more important than health. But a man should appreciate what his actions and goals are costing him. Then, if he chooses, he may pay for them in pain and disease. Often he will decide that his values are poor, that he has been confused and thence change his direction and pace."

The volume is short and readable. It deserves a thoughtful hour or two from every practitioner who occasionally inquires about the art of medicine.—*Comdr. R. G. Berry, MC, USN*

Surgical Forum, Proceedings of the Forum Sessions Thirty-Eighth Clinical Congress of the American College of Surgeons, New York, N. Y., September 1952. *Surgical Forum Committee, Owen H. Wangensteen,* M. D., F. A. C. S., Minneapolis, Minn., Chairman. 716 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., publishers, 1953.

This volume of 129 articles represents "the current results of the interests of young men in the basic medical sciences as related to surgery." It is divided into 11 sections which include stomach; heart and great vessels; heart and blood circulation; gynecology, obstetrics, and anesthesia; lungs and liver; shock; portal hypertension, liver, pancreas, and blood coagulation; water balance and electrolytes; plastic surgery; and thermal injuries and cancer.

All the material is on research. The volume is of main interest to general and thoracic surgeons, gynecologists, obstetricians, and anesthesiologists. One cannot help but believe that much of the material contained in the text will be put into use in clinical surgery in the very near future. Of particular interest along this line is the material presented on artificial pumps to bypass one or both sides of the heart. This book is highly recommended for physicians and residents in these specialties.

—*Col. S. W. French, III, MC, USA*

Modern Concepts of Communicable Disease, by *Morris Greenberg,* M. D., M. S. P. H., Director, Bureau of Preventable Diseases, New York City Department of Health; Assistant Professor of Epidemiology, Columbia University; Attending Pediatrician, Beth David Hospital, New York, N. Y., and *Anna V. Matz,* R. N., M. A., Public Health Nursing Consultant in Communicable Diseases, New York City Department of Health; Lecturer in Communicable Diseases, Willard Parker Hospital, New York City Department of Hospitals. Foreword by *Harry S. Mustard,* M. D., LL. D. 553 pages; illustrated. G. P. Putnam's Sons, New York, N. Y., publishers, 1953. Price $6.20.

This book is an up-to-date presentation of communicable disease for the nursing profession. The first 135 pages are devoted to a summary of modern philosophy with respect to communicable disease, aseptic technics, and nursing care in the hospital and home. The remainder of the book deals with specific diseases and outlines the clinical features, treatment, nursing care, and prevention of each.

It is an accomplishment to crowd all this information into 535 pages and, in so doing, the authors have had to omit much detail. Nurses will find that the book is a concise presentation and a fair statement of present-day thinking and practice. There are many excellent features and the defects are those inherent in condensation.—*R. L. Gould, M. D.*

The Conception of Disease, Its History, Its Versions and Its Nature, by *Walther Riese,* M. D. 120 pages. Philosophical Library, New York, N. Y., publishers, 1953. Price $3.75.

This little book deals with man's ideas of disease, which range from the invasion of spirits and demons, as a cause of pathologic conditions, to bacteria and the subconscious mind. The author points out the importance of the hippocratic approach as a turning point in human thought. For the first time the physician abandoned gods and demons and looked to the patient as the center of diagnostic, prognostic, and therapeutic interest and effort. One of the most absurd theories of disease was that of Rosseau, whose thesis was that primitive man enjoyed perfect health and that disease was a product of civilization. Two or three chapters are devoted to the relation of disease to art. The book is recommended to the intelligent general reader and to the physician, as giving a broad and philosophical view of disease and medical practice.

—*Capt. L. H. Roddis, MC, USN (Ret.)*

The Diabetic Neuropathies by *Joseph I. Goodman,* M. D.; *Siegfried Baumoel,* M. D.; *Leonard Frankel,* M. D.; *Louis J. Marcus,* M. D.; and *Sigmund Wassermann,* M. D. American Lecture Series, Publication Number 151, A Monograph in the Bannerstone Division of American Lectures in Endocrinology, edited by *Willard O. Thompson,* M. D., Clinical Professor of Medicine, University of Illinois College of Medicine; Managing Editor, Journal of Clinical Endocrinology and Metabolism; Editor, Journal of the American Geriatrics Society, Chicago, Ill. 138 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $4.75.

To the clinician the neurologic complaints of the patient with diabetes constitute, not only a therapeutic problem, but also a pathologic and etiologic enigma. The standard textbooks on diabetes are specific enough in most instances, but the clinician may often become confused by conflicting opinions among various authors. This small monograph on the subject will prove helpful in the understanding of the physiologic, pathologic, and anatomic problems involved. It is a straightforward discussion of personal and recorded clinical observations and the theories which have been derived therefrom. The work of five authors has been integrated to cover the different aspects of diabetes neuropathies. Controversial subjects receive frank coverage. The difficulties in evaluating treatment are emphasized, and various hiatuses in our knowledge of certain pathologic aspects are offered as particularly important for future investigation.

This will be a useful book for the clinician. It makes excellent reading for the investigator who would like to have the problem laid frankly before him.

—*Lt. Col. E. D. Palmer, MC, USA*

Surgery of the Pancreas, by *Richard B. Cattell*, M. D., Surgeon, The Lahey Clinic, New England Baptist Hospital, and New England Deaconess Hospital, and *Kenneth W. Warren*, M. D., Surgeon, The Lahey Clinic, New England Baptist Hospital, and New England Deaconess Hospital. 374 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., publishers, 1953.

The stated purpose of the authors is to discuss pancreatic disease with particular emphasis on diagnosis, surgical treatment, and the results of such treatment. This has been accomplished clearly and concisely, and all important aspects of pancreatic disease except diabetes mellitus are covered.

The text is divided into nine separate headings including: anatomy and physiology of the pancreas, congenital malformations, acute pancreatitis, chronic relapsing pancreatitis, pancreatic cysts, pancreatic injuries, islet cell adenomas and hyperinsulinism, carcinoma of the pancreas and periampullary area, and total pancreatectomy. The experiences of the Lahey Clinic with patients suffering from the various types of pancreatic disease are summarized and the conclusions regarding treatment are presented. Representative case histories and statistical charts are included to support the authors' conclusions. Reproductions of roentgenographic films and anatomical sketches are used to clarify diagnosis, operative findings, and surgical technics. The studies and conclusions of other eminent surgeons in this field are summarized and an extensive bibliography is included.

This book will not be appreciated by a medical student but is highly recommended to any surgeon interested in abdominal surgery and the internist concerned with gastrointestinal disorders. This is the most complete, concise, and readable publication on this subject in current medical literature.

—*Lt. Col. P. V. Kiehl, MC, USA*

Clinical Cardiology, edited by *Franklin C. Massey*, A. B., M. D., Assistant Professor of Medicine, Hahnemann Medical College, Philadelphia, Pa. 1,100 pages; illustrated. The Williams & Wilkins Co., Baltimore, Md., 1953. Price $13.50.

This comprehensive book covers the clinical aspects of heart disease. There are chapters on anatomy, physiology, roentgenology, electrocardiography, and the usual clinical varieties of heart disease, including neurocirculatory asthenia and other psychiatric aspects of cardiology. The book is intended primarily for internes, residents, and general practitioners.

The chapter on electrocardiography is excellent but brief, and those on hypertension, disturbances in coronary circulation, and anesthesia and surgery in the cardiac patient, are among the best. The discussion of surgery of congenital and acquired

lesions of the heart is good but would be more valuable if more emphasis had been given to the clinical features and less to surgical technics. One chapter entitled mechanisms and clinical features of congestive failure contains an adequate discussion of the mechanisms but scarcely mentions the clinical features.

The greatest weakness of the book is that of repetition which is inherent in works which have a large number of contributors. The various authors do not always agree which will be confusing to the student. The printing is excellent but the paper is heavy making the book rather ponderous. There is an excellent index.

—*Col. E. M. Goyette, MC, USA*

Rorschach Interpretation: Advanced Technique, by *Leslie Phillips,* Ph. D., Director of Psychological Research, Worcester State Hospital; Associate Professor of Psychology, Clark University, Worcester, and *Joseph G. Smith,* Ph. D., Research Assistant, Commission on Human Resources and Advanced Training, Washington, D. C. 385 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., publishers, 1953.

This book may be expected to take its place alongside the text by Klopfer and Kelley and with Beck's three volumes. It is very comprehensive in its scope, although insufficient attention is given to the recent critical literature. A considerable portion of the presentation is based primarily upon the authors' clinical and personal research experience.

Separate chapters are devoted to the scoring, interpretation, and rationale of the various formal aspects of the Rorschach: location, form, color, movement, shading, and achromatic color. The authors are sufficiently courageous to offer two detailed chapters on content and sequence analyses—approaches which seem to play a prominent but heretofore implicit role in most contemporary Rorschach interpretations. A final chapter presents an elaborate step-by-step analysis of a patient's protocol.

As a teaching manual for advanced graduate students, the book has many points in its favor because it is abundant with hypotheses eagerly awaiting verification or refutation. It was not meant for the hands of a naive psychometrician, particularly because there is no mention of the possible limitations of the instrument.

The authors' statement in the foreword should not be glossed over too lightly: "This book is intended primarily as a practical reference. It is composed largely of statements about relationships between Rorschach performance and other behavior. Unfortunately, few of the relationships which are asserted have been corroborated; most represent guessed-at laws. They are perhaps best employed with equal parts of faith and skepticism."

—*S. Fisher, Ph. D.*

Modern Concepts of Leprosy, by *Harry L. Arnold, Jr.*, M. D., F. A. C. P., Department of Dermatology, Straub Clinic, Honolulu, Hawaii; Contributing Editor, International Journal of Leprosy. American Lecture Series, Publication Number 145, A Monograph in American Lectures in Dermatology, edited by *Arthur C. Curtis*, M. D., Chairman, Department of Dermatology and Syphilology, University of Michigan, Ann Arbor, Mich. 105 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $3.75.

The author states in the preface that "it is hoped that dermatologists and others may find this monograph a happy medium between the brief chapters on leprosy to be found in most general textbooks, and (for them) the unnecessarily detailed accounts found in books devoted exclusively to leprosy. It is written for them and for students in their field, and not for leprologists." He has more than accomplished his objective by producing a readable, illustrated monograph which effectively combines the old and modern diagnostic and therapeutic concepts of this ancient disease. He has successfully avoided the usual confusion associated with texts pertaining to leprosy, by discussing briefly and concisely the etiology, epidemiology, classification and nomenclature, and diagnosis of leprosy, and both preventive and active tuberculoid leprosy and treatment. The various diagnostic procedures are described in detail. The reader may proceed into the more detailed aspects of leprosy through the use of the excellent bibliography of 105 references. This monograph is essential to the library of every dermatologist and others who may be confronted with the necessity of diagnosing and treating the disease.—*Lt. Col. W. N. Piper, MC, USA*

Shame and Guilt, A Psychoanalytic and a Cultural Study, by *Gerhart Piers*, M. D., Staff Member, The Institute for Psychoanalysis, Chicago, Ill.; and *Milton B. Singer*, Ph. D., Professor of the Social Sciences, College of the University of Chicago, Chicago, Ill.; Foreword by *Roy R. Grinker*, M. D. 86 pages. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $3.25.

This is a short, well-written monograph of the differentiation between shame and guilt genetically, phenomenologically, and dynamically. By a simple straightforward presentation the authors have avoided the semantic maze that clouds so much of psychiatric literature. The book is divided into two parts for the psychoanalytic and cultural presentation. In the cultural section the author develops a good reason for doubting the validity of the present divisions of guilt and shame cultures. A more constructive and fruitful approach to the problem of characterizing and comparing cultures is presented. The book can be highly recommended to anyone interested in understanding and helping to modify human behavior.—*Capt. M. E. Roudebush, MC, USN*

Biological Hazards of Atomic Energy, Being the papers read at the Conference convened by the Institute of Biology and the Atomic Scientists' Association, October 1950, edited by *A. Haddow.* 235 pages; illustrated. Oxford University Press, New York, N. Y., publishers, 1952. Price $8.

This volume comprises 24 papers on such varied subjects as radiation damage, genetic effects, protective measures, clinical use of radioisotopes, and therapy in radiation damage. The authors, with the exception of those from the United States and Sweden, are all from the United Kingdom, and are engaged in biologic research in the atomic energy programs of their respective areas. Although the book is a report which probably will not be widely read because of the nature of the subject matter, it gives modern views on the subject of biologic effects of ionizing radiation in a clear, concise manner.

—*Col. R. D. Maxwell, MSC, USA*

The Riddle of Cancer, by *Charles Oberling,* M. D., translated by *William H. Woglom,* M. D. Revised edition. 238 pages. Yale University Press, New Haven, Conn., publishers, 1952. Price $5.

In the author's preface to the first edition of this book he stated that "it is addressed particularly to medical students and to those physicians desirous of some acquaintance with the trend of cancer research today." This was a beautifully and thoughtfully written book which fulfilled the author's purpose in an admirable manner. The revised edition, containing over 30 percent new material, is even more interesting and instructive. The chapter on heredity surveys and particularly in the discussion of the chemical carcinogens has been brought up to date. The role of the viruses in the etiology of cancer is thoroughly considered. Data has been accumulated suggesting that the importance of those agents in the causation of malignant disease cannot be easily minimized.

This book is divided into five main parts: the introductory chapter considers the question of why cancer should interest us, the second outlines the development of knowledge on the nature of cancer, and the third is concerned with a discussion of three hypotheses of cancer etiology (irritation, embryonal, and microbic or parasitic). The important fourth chapter surveys the subject of experimental cancer. The author discusses transplantable tumors and then considers the induced tumors, including those associated with carcinogenic rays, parasites, hereditary factors, tar or carcinogenic hydrocarbons, and steroid hormones.

Evidence pointing to a virus as a cause of cancer is presented and this hypothesis is staunchly defended.

In the concluding chapter the facts in favor of a virus are summarized but some objections to the theory are pointed out. This book is a clear and concise review of fundamental cancer research which is readily understood by a novice in the field. To the knowledge of this reviewer, there is no book in English that covers this fascinating subject in a more interesting or instructive manner. It should command a wide-reading audience, not necessarily one limited to the medical profession, and is recommended without hesitation to all scientists who have an interest in the experimental and theoretical aspects of the cancer problem. An excellent bibliography is provided.

—Capt. C. F. Storey, MC, USN

The Psychology and Psychotherapy of Otto Rank, An Historical and Comparative Introduction, by *Fay B. Karpf*, Ph. D., Author of American Social Psychology, Its Origins, Development, and European Background, et cetera. 129 pages; illustrated. Philosophical Library, New York, N. Y., publisher, 1953. Price $3.

This volume consists of three parts subdivided into eight chapters, a listing of the major works of Otto Rank, and five pages of references. The purpose of this volume is essentially "to sketch out the development of his (Rank's) deviant views and to present an outline of the essentials of his distinctive position."

Part I is a biographical sketch and presents an account of Rank's role in the psychoanalytic movement. Part II deals with a presentation of Freudian, Jungian, and Adlerian psychology. In Part III the author covers the essentials of Rank's psychology and psychotherapy and describes the distinctive aspects of Rank's personality theory. The importance of will doctrine, his approach to the problems of fear, anxiety, dependency, and insecurity are developed and contrasted to the Freudian position. Besides recording the influence of Freud on Rank, the author believes that Rank likewise was a highly important influence on Freud. Rank's training was in sharp contrast to Freud's background which was narrowly medical in preoccupation so that in this respect they complimented each other.

This book is not for the advanced worker in the fields of psychology or psychiatry, but it might prove of value to graduate students in psychiatric social work who draw so much from Rank's contributions. By concentrating solely on the professional development of Rank, and his work with Freud, and then splitting off to develop his own interests, the author has omitted an area of significance, namely, an account of Rank's personal life history and the influence on this work.

—Capt. H. R. Weiss, USAF (MSC)

Conferences on Drug Addiction Among Adolescents. The conferences were held at The New York Academy of Medicine on November 30, 1951, and March 13 and 14, 1952, and were sponsored by the *Committee on Public Health Relations of the New York Academy of Medicine* with the assistance of *The Josiah Macy, Jr. Foundation.* 320 pages. The Blakiston Co., New York, N. Y., publishers, 1953. Price $4.

This is a verbatim record of a series of conferences on drug addiction in which the participating members were recognized authorities in the medical, legal, sociologic, pharmacologic, educational, religious, psychologic, and public health aspects of the problem. The result is a readable collection of both prepared and spontaneous opinions and comments on this multifaceted and complex condition. It will serve to orient those interested in the problem and will acquaint them with the present status of both the medical and social approaches. The reader is impressed not so much with what is known, but rather with the lack of knowledge on the subject—a fact that is obviously recognized by the discussants.

This is an honest and conscientious attempt to crystallize thinking as to what is needed in the prophylaxis, detection, and therapy of drug addiction, with particular emphasis on the adolescent. The book's "eye-opener" potential is its most striking characteristic.—*Comdr. J. B. MacGregor, MC, USN*

Nervous Transmission, by *Ichiji Tasaki,* M. D., Central Institute for the Deaf, St. Louis, Mo. 164 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953.

This book is not for a dilettante or for a quiet Sunday afternoon of casual reading. It is filled with facts and figures in a close interlocking of text and numerous illustrations that require concentrated attention and effort for comprehension. If one has the incentive and motivation, he will find in this thin monograph an excellent review of numerous researches done over several years on single-nerve fiber preparations to elucidate the physiology of nervous transmission. When one reads this scientific report with its excellent bibliography it is difficult to realize that a great amount of the excellent work reported was done in an isolated laboratory where there was a paucity of tools, literature, or stimulation to such endeavors. The greater credit is then due to the worker and to those who encouraged him.

The printing, paper, and binding are excellent. One, however, may well be astonished at an occasional grammatical slip, e. g. (page 17), the word "ringer" has become a small-lettered, unpossessive, prepositional objective not followed by the word "solution." The informal speech of the laboratory worker thus gains editorial acceptance.—*A. H. Lawton, M. D.*

BOOKS RECEIVED

Books received by the *U. S. Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be selected for review in a later issue.

Man's Back, by *Theodore A. Willis,* M. D., F. A. C. S.; Formerly Head, Department of Orthopedic Surgery, St. Luke's Hospital; Consulting Orthopedic Surgeon, U. S. P. H. S. Hospital, Cleveland, Ohio; Member, American Orthopedic Association; American Academy of Orthopedic Surgeons; Clinical Orthopedic Society; Societe Internationale de Chirurgie Orthopedique et de Traumatologie. 161 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $9.50.

Dermatologic Formulary, from the New York Skin and Cancer Unit, Service of Dermatology (Dr. Marion B. Sulzberger, Director), edited by *Frances Pascher,* M. D. Revised 1953. 150 pages. Paul B. Hoeber, Inc., New York, N. Y., publisher, 1953. Price $3.

Essential Urology, by *Fletcher H. Colby,* M. D., Chief of the Urological Service, Massachusetts General Hospital; Associate Clinical Professor of Genito-Urinary Surgery, Harvard Medical School, Boston, Massachusetts; Urological Consultant, Lakeville State Sanatorium, Middleboro, Mass. 2d edition. 650 pages; illustrated. The Williams & Wilkins Co., Baltimore, Md., publishers, 1953. Price $8.

Diseases of the Liver, Gallbladder and Bile Ducts, Volumes I and II, by *S. S. Lichtmann,* M. D., F. A. C. P., Assistant Professor of Clinical Medicine, Cornell University Medical College; Assistant Attending Physician, New York Hospital; Adjunct Physician, Mt. Sinai Hospital; Assistant in Post-Graduate Medical Instruction, University Extension, Columbia University, New York, N. Y. 3d edition, revised. 1,315 pages; 220 illustrations and 3 color plates. Lea & Febiger, Philadelphia, Pa., publishers, 1953. Price $22.00 for the set.

A Clinical Approach to Children's Rorschachs, by *Florence Halpern,* Ph. D., Assistant Professor of Clinical Psychology, New York University College of Medicine. 270 pages; illustrated by charts. Grune & Stratton, Inc., New York, N. Y., publishers, 1953.

The Diabetic Neuropathies, by *Joseph I. Goodman,* M. D.; *Siegfried Baumoel,* M. D.; *Leonard Frankel,* M. D.; *Louis J. Marcus,* M. D.; and *Sigmund Wasserman,* M. D. American Lecture Series, Publication Number 151, A Monograph in the Bannerstone Division of American Lectures in Endocrinology, edited by *Willard O. Thompson,* M. D., Clinical Professor of Medicine, University of Illinois College of Medicine; Managing Editor, Journal of Clinical Endocrinology and Metabolism; Editor, Journal of the American Geriatrics Society, Chicago, Ill. 138 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $4.75.

The Dynamics of Psychosomatic Dentistry, by *Joseph S. Landa,* D. D. S., F. A. C. D., Associate Professor of Prosthetic Dentistry, New York University College of Dentistry; Formerly Clinical Professor of Oral Diagnosis, New York University College of Dentistry; Attending in Charge of Denture Prosthesis, New York Polyclinic Medical School and Hospital; Associate Attending in Charge of Denture Prosthesis, Beth-Israel Hospital; Consulting Prosthodontist, Downtown Hospital, and 6 *contributors.* 435 pages. Dental Items of Interest Publishing Co., Inc., Brooklyn, N. Y., publishers, 1953.

Practical Pedodontia or Juvenile Operative Dentistry and Public Health Dentistry, An Introductory Text for Students and Practitioners of Dentistry, by *Floyde Eddy Hogeboom,* D. D. S., F. A. C. D., Professor of Children's Dentistry, College of Dentistry, University of Southern California, 1921-1949; Former Member Health and Development Department, Pasadena City Schools; Former Member of Children's Hospital Staff, Los Angeles; Chairman, Dental Assistant's Course, Los Angeles Junior College, Los Angeles, 1930-37. Special Chapters by *Forrest Anderson,* M. D., Sc. D. (Med.), former Director, Child Guidance Clinic of Los Angeles and Pasadena; special lecturer in Mental Hygiene, University of California; *Harold Hawkins,* D. D. S., Chico, Calif., former Associate Professor of Bacteriology and Preventive Dentistry, College of Dentistry, University of Southern California; *Thaddeus P. Hyatt,* D. D. S., F. A. C. D., former Professor of Preventive Dentistry, New York University, College of Dentistry; former Director, Dental Department, Metropolitan Life Insurance Co.; and *Harry E. Straub,* D. D. S., special Instructor in Exodontia and Minor Surgery; former Faculty Member, College of Dentistry, University of Southern California. 6th edition. 642 pages; illustrated. The C. V. Mosby Co., St. Louis, Mo., publisher, 1953. Price $12.50.

Textbook of Pharmacology for Nurses, by *Margene O. Faddis,* R. N., M. A., Professor of Medical Nursing, Frances Payne Bolton School of Nursing, Western Reserve University, Cleveland, Ohio; assisted by *Joseph M. Hayman, Jr.,* B. A., M. D., Dean, Tufts College Medical School; formerly Professor of Medicine, School of Medicine, Western Reserve University. 4th edition. 520 pages; 106 illustrations. J. B. Lippincott Co., Philadelphia, Pa., publishers, 1953. Price $4.50.

Emotional Factors in Skin Disease, a Psychosomatic Medicine Monograph, by *Eric Wittkower,* M. D., and *Brian Russell,* M. D., with contributions from *Peter Edgell, Desmond Irwin,* and *John Slorach;* forewords by Dr. *R. M. B. MacKenna* and Professor *D. E. Cameron.* 214 pages. Paul B. Hoeber, Inc., New York, N. Y., publisher, 1953. Price $4.

The Chick Embryo in Biological Research, by *E. D. Goldsmith, Nelson T. Spratt, Jr., Milton Levy, Florence Moog, James D. Ebert, A. M. Schechtman, Heinz Herrmann, Dorthea Rudnick, Viktor Hamburger, Mary Juhn, Peter Gruenwald, James F. Case, B. H. Willier, Walter Landauer, Howard L. Hamilton, W. W. Cravens, Edgar Zwilling, Lois P. Ridgway, David Karnofsky, Frank J. Dixon, George E. Cottral, Herald R. Cox, G. John Buddingh, Donald Greiff, Harold S. Ginsberg, I. W. McLean, Jr., Alexis L. Romanoff, Mary E. Rawles, Priscilla A. Patterson, Rita Levi-Montalcini.* Originally published in Annals of the New York Academy of Sciences, Volume 55, Article 2, pages 37-344. Illustrated. The New York Academy of Sciences, New York, N. Y., publisher, 1953. Price $4.

Cybernetics, Circular Causal and Feedback Mechanisms in Biological and Social Systems; Transactions of the Ninth Conference March 20-21, 1952, New York, N. Y. Edited by *Heinz Von Foerster,* Department of Electrical Engineering, University of Illinois, Champaign, Ill.; Assistant Editors: *Margaret Mead,* American Museum of Natural History, New York, N. Y.; and *Hans Lukas Teuber,* Department of Psychiatry and Neurology, New York University College of Medicine, New York, N. Y. Sponsored by the *Josiah Macy, Jr. Foundation,* New York, N. Y. 184 pages; illustrated. Price $4.

Oral Fat Emulsions, by *Frederick J. Stare, R. W. Swift, Robert P. Geyer, Milton Shoshkes, Theodore B. Van Itallie, Francis D. Moore, Stanley M. Levenson, Elizabeth A. Lounds, Rosalyn Morris, H. Necheles, Anthony A. Albanese, Arthur Grollman, Irving F. Stein, Jr., W. James Kuhl, Jr., Edward M. Goldberg, Morton I. Grossman, Karl A. Meyer, Morris E. Dailey, W. R. Waddell, C. C. Wang, Charles U. Lowe, Charles D. May, George J. Boines, S. D. Jacobson, W. J. Kolff, Icie G. Macy, John P. Peters.* Originally published in Annals of the New York Academy of Sciences, Volume 56, Article 1, pages 1-139. The New York Academy of Sciences, New York, N. Y., publisher, 1953.

Pharmacology and Therapeutics in Nursing, by *Marion Sylvester Dooley,* A. B., M. D., Professor Emeritus of Pharmacology; Consultant on Drugs and Medical Director of the Pharmacy, University Hospital; (State University of New York, College of Medicine, Syracuse, N. Y.); and *Josephine Rappaport,* R. N., M. A., Assistant Director, Division of Nursing Education, Duke University. 2d edition. 486 pages; illustrated with graphs and charts. McGraw-Hill Book Co., Inc., New York, N. Y., publishers, 1953. Price $4.50.

United States Army in World War II. The War Department. Strategic Planning for Coalition Warfare, 1941-1942, by *Maurice Matloff* and *Edwin M. Snell;* Office of the Chief of Military History, Department of the Army, Washington, D. C. 454 pages; illustrated. U. S. Government Printing Office, Washington, D. C., publishers, 1953. Price $3.25.

Differential Diagnosis of Common Diseases of the Eyeground, by *Paul Tower,* M. D., Los Angeles, Calif. 243 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., publishers, 1953. Price $10.

Advances in Veterinary Science, edited by *C. A. Brandly,* University of Wisconsin, Madison, Wis.; *E. L. Jungherr,* University of Connecticut, Storrs, Conn.; Advisory Board: *Sir Thomas Dalling, P. J. Du Toit, W. Frei, W. A. Hagan, A. Hjarre, C. A. Mitchell,* and *B. T. Simms.* 431 pages; illustrated. Academic Press, Inc., New York, N. Y., publishers, 1953. Price $9.

Experimental Atherosclerosis, by *Louis N. Katz,* M. D., Director, Cardiovascular Department, Medical Research Institute, Michael Reese Hospital; Professorial Lecturer in Physiology, University of Chicago, Chicago, Ill., and *Jeremiah Stamler,* M. D., Research Associate, Cardiovascular Department, Medical Research Institute, Michael Reese Hospital, Chicago, Ill.; Established Investigator, American Heart Association. American Lecture Series, Publication Number 124, A Monograph in the Bannerstone Division of American Lectures in Metabolism; edited by *Paul György,* M. D., Department of Pediatrics, University of Pennsylvania School of Medicine, Philadelphia, Pa.; *Louis Leiter,* M. D., Ph. D., Division of Medicine, Montefiore Hospital, New York, N. Y.; and *S. O. Waife,* M. D., Lilly Research Laboratories, Indianapolis, Ind. 375 pages; 46 illustrations, 84 tables. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $10.50.

Modern Concepts in Medicine, by *Julius Jensen,* Ph. D. (in Medicine) University of Minnesota; M. R. C. S. (England), L. R. C. P. (London), St. Louis. 636 pages; illustrated. The C. V. Mosby Co., St. Louis, Mo., publishers, 1953. Price $11.50.

Textbook of Exodontia, by *Leo Winter,* D. D. S., M. D., F. A. C. D., F. A. C. S., Sc. D., (Hon.), LL. D. Revised by *William F. Harrigan,* A. B., D. D. S., M. D., Professor of Oral Surgery, New York University; Director of Oral Surgery Service, New York University-Bellevue Medical Center; Director of Oral Surgery, University Hospital, Meadowbrook Hospital, and *Leo Winter, Jr.,* D. D. S., Visiting Oral Surgeon, Bellevue Hospital, Columbus Hospital. 6th revised edition. 350 pages; 385 illustrations and 1 color plate. The C. V. Mosby Co., St. Louis, Mo., publisher, 1953. Price $8.

Health and Human Relations in Germany, Report of the Second Conference on Problems of Health and Human Relations in Germany, The Williamsburg Lodge, Williamsburg, Va., December 10-15, 1950, *The Josiah Macy, Jr. Foundation,* New York, N. Y. 30 pages.

Health and Human Relations in Germany, Report of a Conference on Problems of Health and Human Relations in Germany, Nassau Tavern, Princeton, N. J., June 26-30, 1950, *The Josiah Macy, Jr. Foundation,* New York, N. Y. 207 pages. Price $1.

Health and Human Relations, Report of a Conference on Health and Human Relations Held at Hiddesen Near Detmold, Germany, August 2-7, 1951, sponsored by *The Josiah Macy, Jr. Foundation,* New York, N. Y. 192 pages. The Blakiston Co., Inc., New York, N. Y., publishers, 1953. Price $4.

Glaucoma Pathology and Therapy, by *Paul Weinstein,* M. D., Associate Professor of Medical Ophthalmology, at the University of Budapest; Chief of the Eye Department of the Jewish Hospital at Budapest. Translated by *Julius Foldes,* M. D., Diplomate of the American Board of Pathology; Fellow of The College of American Pathologists; Director of Laboratories Hazleton State Hospital and St. Joseph's Hospital, Hazleton, Pa. 295 pages; illustrated. The C. V. Mosby Co., St. Louis, Mo., publishers, 1953. Price $8.

Shame and Guilt, a Psychoanalytic and a Cultural Study, by *Gerhart Piers,* M. D., Staff Member, The Institute for Psychoanalysis, Chicago, Ill.; and *Milton B. Singer,* Ph. D., Professor of the Social Sciences, College of the University of Chicago, Chicago, Ill. Foreword by *Roy R. Grinker,* M. D. 86 pages. Charles C Thomas, Publisher, Springfield, Ill., 1953. Price $3.25.

Working Conference on Nursing Education, Report, World Health Organization Technical Report Series No. 60. 30 pages. World Health Organization, Geneva, Switzerland, publishers, 1953. Price $0.20.

Expert Committee on Hepatitis, First Report, World Health Organization Technical Report Series No. 62. 26 pages. World Health Organization, Geneva, Switzerland, publishers, 1953. Price $0.20.

Annual Epidemiological and Vital Statistics, 1950, Part I: Vital Statistics and Causes of Death. 371 pages; illustrated with maps and graphs. World Health Organization, Geneva, Switzerland, publishers, 1953. Price $5.

Expert Committee on Venereal Infections and Treponematoses, Fourth Report, World Health Organization Technical Report Series No. 63. 84 pages; illustrated. World Health Organization, Geneva, Switzerland, publishers, 1953. Price $0.55.

Expert Committee on Insecticides, Fourth Report, World Health Organization Technical Report Series No. 54. 98 pages; illustrated. World Health Organization, Geneva, Switzerland, publishers, 1952. Price $0.65.

Ballistocardiography, The Application of the Direct Ballistocardiograph to Clinical Medicine, by *William Dock,* B. S., M. D., F. A. C. P.; Professor of Medicine, State University Medical Center at New York City, College of Medicine; Visiting Physician, Kings County Hospital, Brooklyn; Consultant in Medicine, Veterans Administration Hospital at Brooklyn; *Harry Mandelbaum,* M. D., F. A. C. P., Lecturer, State University Medical Center at New York City, College of Medicine; Associate in Medicine, The Jewish Hospital of Brooklyn; Physician in Charge, Hypertension and Nephritis Clinic at The Jewish Hospital of Brooklyn; Attending in Medicine, The Jewish Sanitarium and Hospital for Chronic Diseases, Brooklyn; Attending in Medicine, Brooklyn Hebrew Home and Hospital for the Aged, Brooklyn; and *Robert A. Mandelbaum,* B. A., M. D., Assistant in Medicine, The Jewish Hospital of Brooklyn; Adjunct in Medicine, The Jewish Sanitarium and Hospital for Chronic Diseases, Brooklyn; Assistant in Cardiology, Beth-El Hospital, Brooklyn. 293 pages; with 153 illustrations. The C. V. Mosby Co., St. Louis, Mo., publisher, 1953. Price $9.50.

Teaching In Schools of Nursing, Principles and Methods, by *Loretta E. Heidgerken,* R. N., M. S., Ed. D.; Associate Professor of Nursing Education, The Catholic University of America; 2d edition. 596 pages. J. B. Lippincott Co., Philadelphia, Pa., publishers, 1953. Price $5.

Pituitary Chromophobe Adenomas, Neurology Metabolism Therapy, by *John I. Nurnberger,* M. D., Research Associate, the Institute of Living, and Assistant Clinical Professor of Medicine (Neurology), Yale University School of Medicine, and *Saul R. Korey,* M. D., Associate Professor of Neurology, School of Medicine, Western Reserve University. 282 pages; illustrated. Springer Publishing Co., Inc., New York, N. Y., publishers, 1953. Price $7.

Sectional Radiography of the Chest, by *Irving J. Kane,* M. D., Consultant in Chest Diseases, U. S. Naval Hospital, St. Albans, N. Y.; Attending Physician, Chest Diseases, Lincoln Hospital, New York, N. Y.; Associate Physician, Diagnostic Roentgenology, Montefiore Hospital, New York, N. Y. Foreword by *Edward D. Churchill,* M. D. 154 pages; illustrated. Springer Publishing Co., Inc., New York, N. Y., publishers, 1953. Price $7.50.

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—T. V. SMITH
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